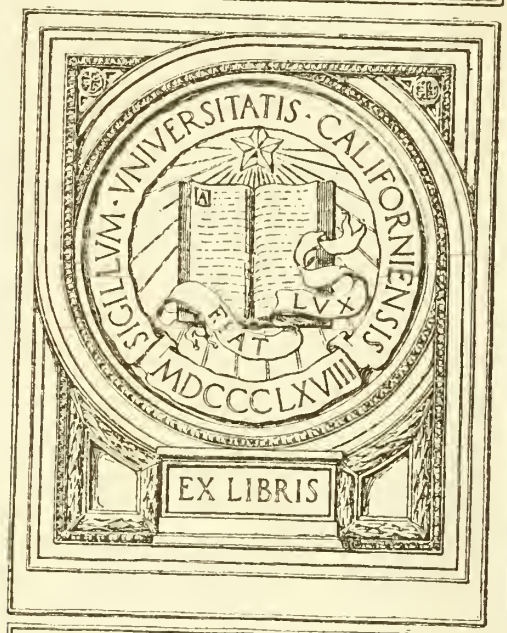
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THE DISTINCTION BETWEEN CHRONIC GLOMERULONEPHRITIS AND HYPERPIESIA (PRIMARY HYPERTENSON)

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Minneapolis

Chronic glomerulonephritis and hyperpiesia are frequently confused clinically, though they are entirely distinct diseases. The failure to make the distinction is usually due to the fact that both conditions commonly have the same main features, viz., high blood pressure and abnormal urine. The object of this paper is to call attention to the fundamental differences in pathologic anatomy and to indicate how the distinction can usually be made on clinical data.

Moderate chronic hypertension is characteristic of hyperthyroidism and is occasionally found in bilateral hydronephrosis and congenital cystic kidneys. A marked hypertension occurs in the toxemia of pregnancy. Hypertension may occur acutely from urinary obstruction, from increased intracranial pressure (brain tumor, hemorrhage, or from excitement, etc.). A high systolic (with low diastolic) pressure is frequent in aortic regurgitation. But, aside from these conditions, which are usually easily recognized, hypertension is to be referred to hyperpiesia or to glomerulonephritis.

Glomerulonephritis is an infection of the kidney, usually streptococcic, in which the glomeruli are primarily and chiefly affected. The bacteria in the circulating blood are phagocyted and destroyed by the endothelium of the glomerular capillaries, but the irritation causes these cells to enlarge and proliferate, resulting in closure of the capillaries. This proliferative reaction is the fundamental and most important process in glomerulonephritis. There are other features of less importance: the formation of epithelial crescents from Bowman's capsule, which compress the tufts; the presence of polymorphonuclear leucocytes in the glomerular capillaries and to some extent outside the corpuscles; and the injury of the tubules. There is seldom necrosis of any cells and practically all the changes that occur in the kidneys subsequent to the infection are to be referred to the effects of closure of the glomerular capillaries. It is true that there is always some tubular injury and often a little interstitial exudate, but these changes are unimportant in the subsequent course of the disease.

When nearly all the capillary bed of a glomerulus is closed, the blood can no longer pass through, and the associated tubule undergoes disuse atrophy to the point where it joins the collecting tubule. When a number of glomeruli in different parts of the kidney are closed the result is an uneven cortical atrophy resulting in a granuular surface. Where the tubules disappear there is a replacement fibrosis often with a few lymphocytes, an appearance responsible for the old term "interstitial nephritis."

The great majority of cases of acute glomerulonephritis terminate ultimately in complete recovery, a few die and a few pass on into the chronic form. In the fatal cases we know that there is occlusion of practically all the glomeruli. In the cases that recover we have evidence, derived from the study of mild cases dying of some other disease, that only a part of the capillary bed is permanently occluded. Acute glomerulonephritis is readily traceable in most instances to some infection, scarlet fever, tonsillitis, etc. The characteristic features are: (1) abnormal urine (albumin, casts, erythrocytes); (2) usually edema, which is often severe; (3) often a moderate hypertension, especially early in the attack; (4) renal insufficiency in the terminal stages of fatal cases. Acute glomerulonephritis is synonymous with acute Bright's disease and is readily recognized clinically.

Subacute glomerulonephritis (synonymous with subacute Bright's disease) is not sharply separable from either the acute or the chronic form. A case can hardly be called subacute until the ultimate outcome is apparent. By arbitrary definition it is commonly employed for cases that begin acutely and are continuous to a fatal result within one year.

The outstanding features are: (1) abnormal urine; (2) edema, usually; (3) hypertension, moderate, but more pronounced than in the acute form; (4) renal insufficiency, which usually becomes more pronounced. At postmortem the kidneys are usually enlarged, cloudy and swollen, with smooth external surfaces. The capillaries of the glomeruli are practically all more or less completely closed and there is widespread tubular atrophy. There has been insufficient time for cortical shrinkage. Apparently all the glomeruli were severely injured in the initial infection. This form of nephritis is not confused with hyperpiesia.

Chronic glomerulonephritis is not synonymous with chronic Bright's disease, but includes one form of this rather ill-defined group. Only an occasional case is traceable to a definite acute attack. The onset is usually slow and gradual and the patient commonly comes to his physician in a well advanced stage of the disease. The early stages have not been well studied, since they are only detected occasionally and by accident in examinations for life insurance, or other purposes. The prominent symptoms of a well developed case are weakness, dyspnea on exertion, pallor, headache, frequent urination, edema, epistaxis, etc.

The urine is practically never entirely free from albumin, although the amount varies widely. Casts vary with the albumin. Erythrocytes are usually present and are especially abundant during exacerbations. In cases of long duration the specific gravity tends to become fixed at a low level and the quantity of urine increases. During exacerbations and in terminal stages there is oliguria.

The blood shows a progressive secondary anemia. Severe anemia is evidence of an advanced stage of the disease.

The blood pressure is almost invariably increased, the systolic usually ranging from 150 to 200. In cases of many years standing it may be higher, but pressures above 240 are apparently very rare.

The heart shows a moderate hypertrophy of the left ventricular type, but since it is not dilated the measurements are not greatly increased. Cardiac decompensation is very unusual.

Functional tests are useful in the diagnosis of advanced cases, but are usually disappointing in the earlier stages. The phenolsulphonephthalein test is perhaps the most delicate, if freed from technical errors. Retention of urea nitrogen and creatinin is a late manifestation. The Volhard concentration test is simple and gives about the same information as the others.

Death occurs in most instances from renal insufficiency, occasionally from edema of the lungs, rarely from an intercurrent or terminal infection such as pneumonia.

The kidneys are often small and contracted (secondary contracted kidney, chronic interstitial nephritis), but they may be normal in size or even enlarged (chronic parenchymatous nephritis). It is seldom possible to predict the size of the kidneys from the clinical data, but in a general way large kidneys are more often associated with heavy albuminuria and marked edema.

Microscopically, one finds large numbers of hyaline glomeruli whose tubules have entirely disappeared. Other glomeruli are enlarged from endothelial swelling but some of their capillaries are still permeable and their tubules are intact or only partially atrophic. Very few are normal. Renal function is carried on toward the last by damaged glomeruli with a variable number of open capillaries. In the large kidneys there are fewer hyaline glomeruli and atrophied tubules. The damaged glomeruli are often associated with tubules in which the cells are swollen and contain abundant lipoid droplets. The cause of this peculiar change is not understood. The usual kidney that one sees is intermediate between the typical contracted (interstitial) and parenchymatous types. Whatever the gross appearance of the kidney, it shows the fundamental feature of glomerulonephritis, viz., inflammatory occlusion of the glomerular capillaries. The arterioles of the kidney are seldom involved except in cases of very long duration in which they may show some hyaline degeneration.

The clinical course of chronic glomerulonephritis is often marked by exacerbations following colds, sore throat, etc. Each infection seems to decrease the permeable glomerular capillaries and bring the patient nearer to renal insufficiency.

Hyperpiesia (primary, or essential hypertension) is chiefly a disease of advanced life. In a group of 200 cases from our postmortem records 89 per cent were over forty years old, and 73.6 per cent were over fifty years. It is apparently over twice as common in males as in females. Hypertension may exist without subjective symptoms. Presum-

ably there is this latent period in most chronic cases, but we have no accurate knowledge of its duration. The first symptoms may be nervousness, irritability, insomnia, headache, nocturia, etc. As the disease progresses symptoms referable to the heart, brain or kidneys may develop.

Two hundred and eighteen cases that came to necropsy may be subdivided on the basis of clinical course and cause of death as follows:

I. Hyperpiesia with cardiac symptoms....			155
A. Myocardial exhaustion		98	
B. Coronary sclerosis		35	
a. preceded by cardiac symptoms...	15		
b. sudden death	20		
C. Brain lesions		6	
a. hemorrhage	1		
b. thrombosis	4		
c. undetermined	1		
D. Renal insufficiency (a prominent factor)		7	
E. Accident		2	
F. Intercurrent diseases		7	
II. Hyperpiesia without prominent cardiac symptoms			63
A. Brain lesions		32	
a. hemorrhage	23		
b. thrombosis	5		
c. undetermined	4		
B. Renal insufficiency		9	
C. Accident		10	
D. Intercurrent diseases		10	
E. Undetermined		2	

I. *Hypertension with cardiac symptoms.* — A. Myocardial exhaustion. Ninety-eight patients suffered chiefly from cardiac decompensation and died apparently from myocardial exhaustion. This type of hyperpiesia is often called "chronic myocarditis." The first symptoms to attract the patient's attention are usually dyspnea, especially on exertion, and edema. The heart shows hypertrophy of the left ventricular type, and, when the left ventricle begins to fail, enlargement of the right heart, also. Relative mitral insufficiency is common; relative aortic insufficiency rare. The blood pressure is usually high, the systolic often being over 200. Sometimes, however, the pressure is normal when the patient enters the hospital. The case with a low blood pressure may be difficult to distinguish from an old valvular defect unless a previous record of hypertension is available. The shape of the heart as seen in the roentgenogram is helpful in the differential diagnosis.

The liver is often palpable and tender, and the spleen may be palpable. There may be physical signs of congestion and edema of the lungs. Remissions of varying duration occur frequently.

The urine commonly shows albumin and casts; but frequently it is normal, especially when the heart is compensated. Functional tests usually show normal values except the phthalein test, which is frequently low (30 to 40 per cent) chiefly because of passive congestion of the kidneys.

The blood is normal, or the erythrocytes and hemoglobin may be increased.

B. Coronary sclerosis. Twenty patients died suddenly of coronary sclerosis, without having had any prominent symptoms previously. In fifteen others there was a history of decompensation with anginal attacks, and death was due mainly to coronary disease.

C. Six patients with cardiac decompensation died of apoplexy.

D. In seven patients with cardiac decompensation renal insufficiency was the chief cause of death. This was determined either clinically by functional tests, or by the extensive renal atrophy found at postmortem.

II. *Hypertension without prominent cardiac symptoms.*—In this group there is little or no clinical evidence of myocardial exhaustion and no passive congestion of the liver postmortem. The most common cause of death is apoplexy. Nine patients died of renal insufficiency. Many die of accidents and of intercurrent diseases, such as pneumonia and carcinoma. The urine is frequently normal except in those with renal involvement. The erythrocytes and hemoglobin are normal or increased except in a few cases with marked renal insufficiency in which there may be secondary anemia.

Postmortem findings. *Heart.* Left ventricular hypertrophy is constant. In cases with prolonged decompensation the right ventricle is also enlarged and all the chambers are dilated. The coronary arteries show atherosclerosis, usually somewhat more advanced than the average for this age group, and in thirty-five cases coronary disease was so pronounced that it was considered the immediate cause of death. The myocardium shows hypertrophy but no other changes except those attributable to coronary disease. The mitral valve frequently shows a demonstrable relative insufficiency from dilation of the heart chambers. *Kidneys.*

Aside from passive congestion the kidneys are usually fairly normal on gross examination. However, slightly granular external surfaces with adherent capsules are frequently seen. Kidneys with an appreciable gross atrophy were found in sixteen cases and of these only eight were typical primary contracted kidneys. This form of contracted kidney is also called chronic Bright's disease. There are all transitions from typical contracted kidneys to those that appear entirely normal. Microscopically in the kidneys with gross contraction there are areas of atrophy corresponding to sclerotic arteries and arterioles. There are many hyaline glomeruli with atrophic tubules. The atrophy is due to closure of small arteries and arterioles. The glomeruli show no changes except atrophy. There is no endothelial proliferation or crescent formation, such as are found in glomerulonephritis.

Arteries. In the small arteries one finds a marked thickening of the intima due to an increase of elastic tissue. The media undergoes atrophy. These small arteries assume the structure of large arteries such as the carotids. The arterioles show typically a deposit of hyaline under the intima with a resulting stiffening of the wall and narrowing of the lumen. The muscular layer undergoes atrophy. These changes in the arterioles are frequently found in kidneys that show no gross or microscopic atrophy. A diagnosis of hyperpiesia may be made from microscopic examination of the kidneys when this lesion is present.

But not all kidneys show arterial disease. In our 218 cases the arterial changes may be classified as follows:

Involvement of small arteries	Per cent
Severe	64.8
Moderate	16.6
Slight	18.1
No disease	0.5

Involvement of arterioles	Per cent
Severe	57.7
Moderate	18.5
Slight	12.7
No disease	16.1

The degree of involvement of the small arteries and arterioles has no relation to the size of the heart or the known duration of the disease. No case of marked renal arteriolar sclerosis was found in an examination of the kidneys from 4,000 necropsies except in cases of hyperpiesia; but, as noted above, many cases of hyperpiesia show no renal arteriolar sclerosis.

The arterioles of the brain and pancreas often show sclerosis, but not so frequently as those of the kidney. Clinical examinations indicate that the retinal arterioles are involved as often as the renal.

The principal differences between chronic glomerulonephritis and hyperpiesia may be given in tabular form.

Chronic glomerulonephritis—
- Age—44 per cent over 40 years
- Blood pressure—Usually moderate hypertension
- Size of heart—Moderate enlargement
- Cardiac decompensation—Very rare
- Secondary anemia—Constant in advanced cases
- Renal function—Low in all advanced cases
- Urine—Always abnormal
- Eyegrounds—Arteriolar sclerosis rare
- Kidneys—Glomerulitis

Hyperpiesia—
- Age—89 per cent over 40 years
- Blood pressure—Usually marked hypertension
- Size of heart—Marked enlargement
- Cardiac decompensation—Present in over 60 per cent
- Secondary anemia—Only in some of renal type
- Renal function—Good except in renal type (8 per cent)
- Urine—Often normal
- Eyegrounds—Usually arteriolar sclerosis
- Kidneys—No glomerulitis; usually arteriolar sclerosis

INTERSTATE ASSEMBLY

This department is all excited over the presence in town of hundreds of visiting doctors.

When one pauses to think how much any and all of them know about one's insides,—how easily they could blueprint one's entire internal economy,—one wonders whether these learned gentlemen do not, after all, regard the individual human being more or less as a collection of giblets enclosed in glass.

A pretty thought, at least.

As for their several and collective vocabularies, the average equipment in this respect simply swoons before it.

Not only is the extent of their terminology positively staggering; but its confusions (to the lay mind) are endless.

Thus we live to learn that phlebitis is not caused by the bites of fleas, but by—well, by something else. Psoriasis, it appears, has no connection whatever with sore eyes, and the diplococcus, mean as he is, is not responsible for the ailment known as diplopia.

It all goes to show how foolish it is for the crass amateur to imagine that he knows anything about anything that ails him. Yes, bichloride, it is! — Frances Boardman, St. Paul Dispatch.

THE ETIOLOGY OF THE CHRONIC HEART MUSCLE DISEASES OF FREQUENT OCCURRENCE IN GENERAL PRACTICE*

George Fahr, M.D.
Minneapolis

When I began teaching medicine at the University of Minnesota some four years ago I found that the senior students had been impressed with the notion that chronic heart muscle disease not associated with primary valve defect (chronic endocarditis), adhesive pericarditis, or syphilis was largely attributable to chronic foci of infection in the teeth, tonsils, sinuses, etc. Most of these students thought of the heart muscle disease as myocarditis, a name which implies inflammatory processes usually of infectious origin. At the same time I found that many of the general practitioners with whom I came in contact believed very firmly that foci of infection were largely responsible for heart muscle disease in failing hearts not exhibiting signs and symptoms of primary valve defect, adhesive pericarditis, or syphilis. It has been possible to impress upon our students that there is no convincing evidence for this view and much good evidence for other factors in the production of chronic heart muscle disease, so that today very few of them attribute much importance to foci of infection as a principal cause of chronic heart muscle disease, at least in our examinations and quizzes. On the other hand, I find that the general practitioner still believes very firmly that foci of infection are largely responsible for chronic heart muscle failure in hearts in which there has been no previous valvulitis (endocarditis), adhesive pericarditis, or syphilis.

It is of considerable importance to know exactly what are the factors involved in the causation of a disease, for it may be that we can learn how to eliminate or to modify these factors ultimately in such a way as to increase the expectancy or comfort of persons tending toward the disease. I have been engaged upon studies in the etiology of chronic heart muscle disease for some years and I shall attempt to give you a short résumé of the evidence for and against various etiologic factors.

*Read before the Southern Minnesota Medical Association, Owatonna, Minnesota, May 18, 1925. From the Department of Medicine, University of Minnesota.

We find at autopsy that the larger proportion of hearts of persons who have died of chronic heart muscle disease show only an increase in weight largely due to hypertrophy of the left ventricle. In a few cases hypertrophy of the right heart only is present. Sometimes they also show moderate or marked degrees of necrosis of fibres with scar tissue replacement. This fibrosis is found in 20 per cent of the hearts showing left ventricular hypertrophy, as well as in an equal number of hearts in which there is no hypertrophy. A few hearts show only fatty degeneration of the fibres, and a very few may show a chronic myocarditis consequent upon an acute myocarditis.

If we take the hearts showing only cardiac hypertrophy, mostly of the left ventricle, we find that the hypertrophy can be explained only upon the basis of increased blood pressure. Hypertrophy is due to increased work and there are only three variables in the equation for heart work: minute volume, blood pressure, and velocity. The latter may be neglected, excepting in severe anemias. Minute volume increase would lead to equal hypertrophy of both chambers. Therefore, we have only high blood pressure in the systemic circulation to explain the left ventricular hypertrophy. Moreover, examination of the kidneys of these cases will nearly always show some evidence of arteriolar sclerosis and this we know to be a lesion associated with hyperpiesia, a disease in which high blood pressures are present for many years before heart failure results. For these hearts, then, and they represent the majority of hearts found in those who have died of chronic heart muscle disease, high blood pressure of many years' standing is the one outspoken factor in causing myocardial exhaustion and failure insofar as pathology throws any light on the subject.

In this country apparently only a very small number of hearts will show right ventricular hypertrophy exclusively. These are cases in which there is at the same time evidence of severe pulmonary disease as emphysema, chronic bronchitis, or long-standing, severe bronchial asthma. Here again the increased work factor is hypertension; hypertension in the pulmonary circuit due to increased resistance in the pulmonary circulation. In Europe these hearts are more common than in this country.

The second group of hearts, those with scar tissue formation, are practically always found in cases in which the coronary vessels are diseased and wholly or partially obstructed.[1,2] In fact, the scars are the result of the usual scar tissue replacement of fibres killed by anemic necrosis consequent upon partial or total coronary artery or arteriole closure. The evidence from pathology in these cases is for coronary disease as a prominent factor in chronic heart muscle disease. About one-half of these hearts also show left ventricular hypertrophy and intima disease of the small renal vessels. In these cases we may therefore say that high blood pressure and coronary sclerosis are two factors of great importance in the production of heart failure in these hearts.

The third group of hearts, those in which only fatty degeneration is present and excluding all cases of acute heart disease with fatty degeneration, is small in number, perhaps not more than 5 per cent of all the hearts of chronic heart muscle disease cases. It also accompanies pathological evidence of hypertension and coronary disease in some cases. The causes of the fatty degeneration can not always be found. Sometimes it is chronic alcohol poisoning; sometimes, phosphorus or arsenic poisoning; sometimes it is due to anemia; sometimes it is associated with severe infections which have been terminal events. It is possible that chronic foci of infection do at times lead to fatty degeneration of the heart muscle, but up to the present this has not been proved.

We can sum up the pathological evidence as to the factors concerned in chronic heart muscle disease as follows: hypertension is the important factor in the largest number of cases; coronary disease is the important factor in a large number—approximately one-fourth as many as hypertension not associated with coronary disease; hypertension and coronary disease are associated together in about as many cases as coronary disease alone; and various toxic agents, as yet frequently unknown, may cause a small percentage of chronic heart muscle disease. Chronic myocarditis is a rare disease.

Now let us examine the clinical evidence. Seventy to 75 per cent of all cases of chronic heart muscle disease seen by me at the University and at the Minneapolis General Hospital have blood pressures above 170 systolic and 100 diastolic. The majority have blood presures above 200 systolic, and where careful records have been kept these pressures were present for at least four to ten years. If we remember that these patients are bed patients in mild or severe decompensation and also remember that blood pressure tends to fall in hyperpiesia and may even reduce to normal when the patient is put to bed, I think it is no exaggeration to say that high blood pressure is an important factor in producing chronic heart muscle failure in 75 per cent of all cases of so-called "myocarditis." A calculation shows that hearts sustaining blood pressures over 240 mm. Hg. do more work per day than the hearts of athletes training for and taking part in severe competitive games; and the hypertension heart may do increased work every day in the year for ten to fifteen years. After some years of this the left ventricle slowly dilates and symptoms of dyspnea develop, often very slowly and insidiously.

X-ray examination gives very good confirmatory evidence of the statement that high blood pressure causes heart failure. When a chamber of the heart becomes insufficient the intraventricular pressure in that chamber rises and the chamber tends to dilate. The pericardium tends to prevent dilatation at first but ultimately the pericardium stretches and demonstrable dilatation of the heart chamber accompanies it. The *x*-ray outline of left ventricular dilatation is typical in the "mean normal" heart. We get a figure suggesting a sock. Only aortic valve disease and hypertension give this *x*-ray figure. It is usually very easy to exclude aortic disease by means of physical signs. A sock-shaped *x*-ray outline of heart, where aortic disease is excluded, means hypertension heart. A large number of hearts in patients with chronic heart muscle disease give this *x*-ray outline. Not infrequently we find this shape of heart in heart failure and at the same time the blood pressure is not elevated. Studies of our cases have shown in many of these cases a previous record of hypertension. We have records of cases exhibiting blood pressures over 200 systolic for three and four years, yet at subsequent examinations showing normal blood pressures. Our studies of such cases justify the statement that high blood pressures or hyperpiesia in from 5 to 10 per cent of all cases fall to normal or

[1] Aschoff: Die hentige Lehre von den pathologisch-enanatomischen Grundlagen, der Herzschwäche. Jena. 1906.

[2] Clawson: The Myocardium in Non-Infectious Myocardial Failure. Am. Jour. Med. Sci., CLXVIII, 648, 1924.

near normal after being elevated for years. For this reason we believe that hypertension is an etiologic factor in even more than 75 per cent of all chronic heart muscle disease.

Further evidence that some cases of heart disease due to hypertension show no elevated blood pressure at the time of hospital examination is found at autopsy. We have seen cases of heart failure with normal blood pressure die and come to autopsy where the pathological evidence of previously existing hypertension was found.

The very best evidence that not all cases of hypertension heart show elevated blood pressures at the time of examination is found in the eye ground examination. We are now in position to diagnose hyperpiesia (essential vascular hypertension) with surety from the ophthalmoscopic findings. The large majority (80 per cent) of hyperpiesia cases in late stages show pathologic processes in the retinal vessels comparable to those seen in the kidneys. We frequently see cases in which the blood pressure is normal at the time of examination, yet the eye ground study gives unequivocal evidence of previously existing high blood pressure. Such studies have convinced us that even more than 70 to 75 per cent of all chronic heart muscle disease is or has been associated with high blood pressure.

By means of the *x*-ray we have followed some of our cases of hyperpiesia from a stage in which the heart shows no *x*-ray evidence of left ventricular dilatation into stages of increasing dilatation and finally decompensation. These hearts may dilate considerably before clinical evidence of decompensation is evident. A permanent drop of blood pressure is not often seen, but I have seen a few cases. In these cases the progressive dilatation stopped and even reduced in extent and the mild clinical symptoms of decompensation disappeared —in one of my cases disappeared for eight years.

Summing up: clinical evidence indicates that at least 75 per cent of all chronic heart muscle disease is associated with high blood pressure and the high blood pressure is at least one very prominent factor in the left ventricular dilatation and heart failure.

Clinical evidence for coronary sclerosis is not as frequently obtained in cases of coronary sclerosis as clinical evidence of hyperpiesia is obtained in cases of hypertension heart. *Attacks* of angina pectoris, *attacks* of cardiac asthma, especially *attacks* of nocturnal cardiac asthma, and a negativity of the T wave in leads I and II are not infrequently evidence of coronary disease, but many cases of coronary sclerosis come to post-mortem with no clinical evidence of disease. Post-mortem evidence is the best indicator we have of the incidence of this type of chronic heart muscle disease. The autopsy material of the Pathological Department of the University would lead us to believe that approximately 15 per cent of all cases of chronic heart muscle disease are associated with coronary sclerosis alone; about an equal number are associated with both hypertension and coronary sclerosis.

We can therefore account for the etiology of about 90 to 95 per cent of all cases of chronic heart muscle disease. At the present moment there are about 5 to 10 per cent of all cases for which we have difficulty in assigning well established etiology. Some of these cases can be accounted for as syphilis of the myocardium, an etiology stressed by Warthin and proved by him for some cases. Chronic intoxications of various kinds will account for some of these cases. No one can deny that chronic foci of infection may account for some of these cases, but we need proof of it. Certainly true chronic myocarditis is rarely seen by the pathologists and fatty degeneration of the heart not associated with hypertension or coronary disease is also not very common.

Moreover, no one can deny that chronic foci of infection may be an adjuvant etiologic factor in the production of heart failure in cases of hypertension heart and in cases of coronary sclerosis. At present there is no good evidence for this. To shoot a few cubic centimeters of a broth culture containing streptococci into a rabbit is to produce a severe septicemia. Lesions thus produced in the heart muscle are either of the nature of abscesses or acute toxic myocardium or acute interstitial myocarditis, and are not analogous to the lesions seen frequently in the chronic heart muscle disease of our patients.

Perhaps it will be argued that cases of chronic heart muscle disease appear to live longer or develop decompensation more slowly after removal of foci of infection. So far as I know no well-controlled series of cases has ever been published on this subject. I have not been impressed with

any beneficial results definitely and exclusively attributable to removal of foci of infection in cases which have come under my own observation. Cases of hypertension heart discovered early may live for a number of years in comparative comfort and free from severe decompensation if given a regime tending to reduce activity of various kinds. A reduction in blood pressure will tend to longer expectancy. The factors of reduced activity, reduced blood pressure, and degree of myocardial exhaustion, must all be evaluated carefully when discussing the effects of removal of foci of infection upon the expectancy and rate of development of decompensation in hypertension hearts and in coronary sclerosis. As every one knows, the determination of the degree of myocardial damage is a difficult problem. Under these circumstances it is at present impossible to say accurately how much good is really done by removal of foci of infection and the argument "exjuvantibus" can carry little weight in a discussion of foci of infection as a factor in the etiology of chronic heart muscle disease.

THE STUDENT HABIT

When the modern student compares his outfit of brain with that which was given to his ancestor in remote times he meets with another surprise. The men who lived in Europe twenty thousand years ago were just as well equipped as he is as far as concerns size and form of brain. What did those ancient hunters do with so big a brain? They had no professional examinations to pass, no briefs to master, no leaders to write, no mathematical problems to solve, no ancient classics to translate, no sermons to prepare and preach. If brains were given to us merely for such purposes, then those ancient hunters had somehow come by a superfluity. Brains, however, serve the needs of much more than the intellectual side of our lives; beneath the intellectual centres lie a myriad of others which subserve more menial duties—by the exercise of which we fill the cup of life's enjoyment.—*Sir Arthur Keith, Lancet, Oct. 3, 1925.*

HONORIFICABILITUDINITY R. I. P.

Serious case of alphabetical elephantiasis reported in the *Daily Telegraph:*

At the recent Dental Exhibition attention was drawn to a tremendously long word used to describe a germicide. Long as it was, it is easily beaten by one that appears in the program of the London Medical Exhibition, opened at Westminster yesterday. It is as follows: "Dimethylaminobenzoyldimethylethylcarbinol." The substance is stated to be a hydrochloride, used as a spinal anesthetic.

Dr. Johnson outdone by some Cockney ward-walker!—*The Living Age.*

HEART PAIN: VARIOUS TYPES AND CLINICAL DIFFERENTIATION*

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A cursory review of the standard medical text books fails to show any classification of heart disease based on the symptom, pain. Clinically, it is often imperative to make a differential diagnosis based largely on this symptom. To facilitate matters I have found it helpful to divide heart pain into the following groups: pain of angina pectoris, pain of coronary infection, the pain of aortitis, pain of myocardial origin and pain of pericardial origin, and will discuss each type in detail.

Pain of Angina Pectoris.—The pain of angina pectoris arises in the root of the aorta, just above the aortic valves, may or may not be associated with coronary narrowing and is felt by the patient as a seizure of severe pain located high in the sternum. In this position it may remain fixed or may radiate into the left axilla and down the left arm to the hand and fingers, or up into the shoulder, neck or jaw. Occasionally, the pain may radiate down the sternum onto the abdomen, producing muscle spasm and skin hyperesthesia in the epigastrium and along the right costal margin, thus suggesting gallbladder origin.

Angina usually occurs in the fifth or sixth decades of life and is supposed to be chiefly a syndrome of city life. Men are especially susceptible, particularly those whose occupation causes stress, strain, anxiety, worry and great responsibility. Therefore, we find doctors, lawyers, bankers, stock brokers, etc., making up the majority of its victims.

Wenckebach speaks of the great increase in the number of cases seen by him in the troublous and uncertain times in Austria after the war, recalling upwards of a thousand cases where previously his entire years of practice had yielded not more than one hundred and fifty cases.

In a typical case, the first seizure may occur in a robust, vigorous man of about fifty years who has previously considered himself healthy. One day while running for a street car, or hurrying up a flight of stairs, or engaging in some unusual exertion as on a hunting trip, he is suddenly seized

*Read before the Southern Minnesota Medical Association, Owatonna, Minnesota, May 18, 1925.

by this sternal pain and believes he is going to die. He stands transfixed and staring apparently not daring even to breathe for fear of increasing the agony. It is surprising how long a patient may go without seeming to breathe during an attack.

In most heart conditions dyspnea is an important symptom; in angina pectoris pain is the dominant symptom. During an attack the heart rate does not alter nor is the rhythm disturbed. Beyond a slight increase in hardness the pulse shows likewise no change, nor are the heart tones usually affected. The heart may show slight enlargement and the sounds show a slight shortening of the apical first or even a faint soft systolic murmur confined to the apex.

The blood pressure during an attack may be unaffected, or slightly or moderately elevated, many patients showing systolic readings ranging from 160 to 200 mm. during the attack with a drop to the previous level as soon as the attack has subsided.

The attack may last one-half to two, three or five minutes. After it has passed the patient may feel a little shaken, but soon is able to proceed as usual until the next seizure. Death may occur in the first, second, or third attack, or there may be daily attacks for years.

Once these seizures are established the victim soon learns that while he may be fairly active in the morning he must be more and more cautious to avoid attacks as the day advances. He is particularly susceptible in the evening shortly after dinner, when exertion may precipitate an attack, or, if the meal has been a hearty one, he may even sustain an attack while sitting quietly in a chair reading the paper.

While exertion is the chief exciting cause, excitement is a close second, and as the explosive pathways become better traveled, such minor things as swallowing, coughing, sneezing, straining at stool, etc., may bring on an attack.

During the free intervals one is often surprised to find so little apparently wrong with the heart. Allbutt has said that many of these angina sufferers show so few signs between attacks that if they submitted to a life insurance examination and said nothing they would very likely be passed. It is the robust, slightly overweight individuals who tend to suffer from angina and not the thin, feeble, debilitated individuals. Furthermore, in a majority of instances the heart rhythm is undisturbed and the rate unaltered either during the attack or in the free interval.

Syphilis plays a rôle of minor importance, as shown in a group study by Levine,* in which he found only 7 per cent with positive Wassermann or other positive signs of syphilis. An equal percentage showed signs of diabetes.

Perhaps the most striking finding in this study of Levine's was the incidence of recent coronary infarction in the autopsies of cases with a history of angina. A majority of these showed blocking by thrombus or clot in one or more twigs or prominent branches of the coronaries. The natural deduction is that patients with angina pectoris live until a sufficiently important coronary branch is blocked. One can readily see how necessary it is therefore to differentiate between the pain of angina pectoris and the pain of coronary obliteration.

Pain of Coronary Infarction.—In a patient the victim of angina pectoris whose attacks have been brief and have passed either spontaneously or with the help of nitrites, one day there occurs an attack of greater severity which lasts from a half to one hour, is not relieved by nitro-glycerine and causes the patient to "lay up" for a few days. Undoubtedly a small twig of the coronary has been plugged by a clot, but collateral circulation has become established and the heart can go on.

Some time later severe pain again occurs which the nitrites do not relieve, the patient is nearly in collapse, with pulse weak, thready, and rapid, face pale and covered with a cold damp sweat which may even drench the chest as well. The heart tones are feeble and of a tic-tac quality, the pain is agonizing and requires morphine in doses of one-half to three-fourths grain, which merely blunts the pain, but does not obliterate it. The patient must go to bed, where, in spite of rest and morphine, the pain may continue for upwards of twelve hours or longer. The blood pressure is low: 80–95 mm. systolic, 50–60 mm. diastolic. The liver may be enlarged and tender, with muscle spasm and rigidity and tenderness in the epigastrium, or without the liver enlargement the pain may be referred down the sternum onto the abdomen, producing muscular rigidity and tenderness suggesting the pain of gallstones. Often these patients vomit, particularly if the attack comes close to a hearty meal (which

*Angina Pectoris. — Samuel A. Levine. Jour. Am. Med. Assn., Sept. 16, 1922.

is frequently the case), and may continue to vomit. Most of them soon show temperature elevation to 100° to 101° with leukocytosis from 15,000 to 30,000. These findings frequently suggest gallstones or an acute surgical abdomen, and some have come to operation and either die on the table or within a few hours after the operation, for the heart is already struggling against an almost overwhelming insult and the slightest additional shock may finish it.

At autopsy these infarcted hearts show leukocytic infiltration in the infarcted area with softening. Rupture resulting in hemopericardium and death or, if the area is not too large, healing by fibrosis and consequent thinning of the wall may be the outcome. The temperature and leukocytosis may be explained on the basis of this inflammatory reaction around the infarcted area in the heart.

In a proportion of these patients a friction rub develops over the precordium which may help in the differential diagnosis. Of course, as shown by Herrick,* a number of these patients with coronary infarction die instantly or within an hour. The rest live twenty-four hours to three or four days, or recover. Many of them present gallbladder symptoms which are very confusing. So difficult is the differential diagnosis that Faulkner, Marble and White,† of Boston, studied the histories of thirty cases of each condition and came to the following conclusions:

(1) That females predominate in the gallbladder group, and males in the coronary group.

(2) That coronary cases average fifty-eight years of age and gallbladder cases ten years younger.

(3) That the gallbladder group gave a much longer history than the coronary group, the former having a history of two and a third years, the latter six and a half months.

(4) That the pain may be confined to the abdomen or thorax in either case. Radiation into the arms favors coronary disease; into the back and under the shoulder blades, gallbladder disease.

Furthermore, coronary occlusion is often associated with a sensation of constriction in the chest never experienced in gallbladder disease. Likewise, the pain in coronary occlusion is likely to be constant while that in gallbladder disease commonly occurs in recurrent attacks of pain.

The authors report some cases, one of which is so dramatic I must include it here:

Case 1. "Superintendent of detectives, aged 60, well developed and obese, weight 220 pounds. Referred by home physician for operation for gallstones. History of repeated attacks of very severe pain in lower right hypochondrium and indigestion between attacks. Never jaundiced. For several years worked hard and no vacations. Following a week's stay in hospital felt better and condition improved markedly. Examination the night before death revealed nothing except heart sounds of tic-tac quality, rate 64, rhythm regular, blood pressure 125/80, lungs clear. No tenderness or spasm in abdomen, liver edge not palpable. urine negative. In view of the extreme obesity and marked improvement after a week's rest in the hospital it was decided that in the absence of emergency indications for surgical intervention he should take a prolonged vacation with dietary restrictions and return in three months. Next day he was found dead on the floor of his room. Necropsy revealed complete arteriosclerotic occlusion of the descending left coronary with infarction in the left ventricular wall, rupture of left ventricle and hemopericardium. Gallbladder contained two gallstones—mucosal lining intact."

E. R. LeCount* of Chicago reported on twenty-six autopsies in which he found coronary occlusion. One on a middle-aged man, the patient of a noted Chicago surgeon, who had been ill for two months with the diagnosis of gallstones. He was found dead in his chair. Autopsy revealed complete coronary obstruction, but no gallstones.

Mrs. Louisa H., aged 65, was admitted to the Miller Hospital in February, 1923, complaining of abdominal pain, nausea and vomiting. She gave a history of frequent typical gallstone attacks. She showed no edema nor jaundice. Temperature was normal, pulse 72 per minute, white blood cells 13,600, urine contained albumin and pus. Blood pressure was not taken. After thirty-six hours operation was performed (no record of cardiac examination). Patient was considered a poor risk on account of obesity, and seven gallstones were simply removed and a drain inserted. Pulse ranged from 120-150 during the operation, and was 90 on being returned to room. Seen at 8 P. M., condition was good. At midnight the patient awoke complaining of pain in the epigastrium, and was dead in one-half hour. Autopsy showed a rupture of the posterior surface of the left ventricle, the pericardial cavity being filled with clotted blood. The coronary arteries were sclerosed throughout, with one area showing a grayish red thrombus adherent

*Herrick: Jour. Am. Med. Assn., Dec. 7, 1912.

†Faulkner, Marble and White: Jour. Am. Med. Assn., Dec. 27, 1924.

*Le Count, E. R.: Jour. Am. Med. Assn., April 6, 1918.

to the arterial wall and occluding the lumen, with a second area of infarction near the site of rupture.

Examples of similar cases might easily be multiplied, but these mentioned are sufficient to show the diagnostic pitfalls and warn us all to be wary in attempting surgery in cases of this type.

Pain of Aortitis. — This type of pain must be mentioned to complete the discussion, but the symptoms and signs of aortitis are different so that confusion need not occur.

We have two types, acute aortitis associated occasionally with influenza, rheumatic fever, or early syphilitic change, and the chronic type in which aneurysmal change predominates and syphilis is the chief etiological factor.

In aortitis the pain is a constant grinding one, high in the sternum, often radiating through to the back, generally associated with systolic murmurs to the right of the sternum, but sometimes with aortic regurgitant murmurs to the left of the sternum. Pain is generally worse at night on lying down or in the daytime on exertion. Dyspnea is commonly present. Usually the pain responds magically to iodides, since the majority are of syphilitic origin.

Pain of Myocardial Origin.—I have described in detail the pain of angina pectoris and that associated with coronary infarction in order to make a clearer differentiation between these conditions and the pain of *myocardial* origin.

While the older teachings were less explicit in separating these as clinical entities, and while Mackenzie still refers to the pains which I class as of myocardial origin, as "toxic angina," it is becoming a gradually accepted fact that these three syndromes have different underlying pathologic bases and physiologic properties.

Just as any skeletal muscle may ache when used too long without rest—or a swimmer may have a painful cramp in the calf muscle, so I believe the heart muscle may respond with painful sensations under certain conditions.

Pain of myocardial origin is, I believe, an expression of heart muscle fatigue or exhaustion. It probably does not occur in perfectly normal hearts, but arises as a result of stress or strain in the presence of systemic toxemia or low grade chronic bacterial infection.

It is not infrequently found in cases of chronic hypertension, particularly in the presence of foci of infection or associated with sudden sharp rises in pressure. It occurs likewise in certain valvular diseases, chiefly in mitral stenosis, where it is a troublesome symptom in a majority of the cases.

Pain becomes increasingly frequent as the mitral orifice grows narrower and of all heart lesions is one of the most crippling to the patient and rebellious to treatment.

Pain occurs also in aortic regurgitation, though far less frequently than in mitral stenosis.

Myocardial fatigue pain is found frequently in women at the menopause, sometimes associated with a soft apical systolic murmur and slight elevation in blood pressure.

I have repeatedly found it in high-strung slightly built women of the asthenic type, between the ages of twenty and thirty years, who harbor some low-grade chronic toxemia, such as recurrent appendicitis or intestinal stasis, and are over-working and under-resting.

It is found often in the debilitated tired mother between thirty to forty years who perhaps has had too many children, has had too much work to do and inadequate rest at night for years, and who has poor posture, ptosis and a flabby abdominal musculature.

The pain of myocardial origin arises in the ventricles of the heart and is referred to the left anterior chest wall, where it is felt usually as a dull continuous ache in the region between the fourth rib, the anterior axillary line, and the lower costal border; the commonest site, however, is in the region over the cardiac apex. If the condition is severe there may be skin and muscle hyperesthesia in this region as well as referred sensations down the left arm. The pain may be increased by exertion or emotion, at times taking on a sharp stabbing character.

But this need not cause it to be confused with angina, for the pain is not in the sternum nor has it that sudden arresting quality of angina nor the magical relief from nitrites; neither is it associated with the signs of collapse, as seen in coronary infarction.

The pain may be continuously present for hours, days or weeks, increasing or decreasing as heart strain increases or decreases. It seems to indicate a temporarily limited heart capacity which may show few signs of decompensation.

It has been my custom for years to try out cases where the condition of the myocardium was not at first determinable with a few tonic doses of digi-

talis. In some cases with pain, the pain has been reduced without any other change in the patient's regime. In others the pain has been increased by digitalis and this called for rest.

A majority of these patients respond to rest and digitalis, which adds evidence to the myocardial origin of these pains. In a certain proportion of cases where the patient is high-strung and the threshold for nervous stimuli is low, nerve sedatives must be added.

Cases of myocardial fatigue pain I believe make up the majority of all cases of heart pain, and when properly diagnosed are remarkably responsive to treatment.

Pain of Pericardial Origin.—This type of heart pain need not be confused with the other types previously mentioned. It is usually of rheumatic origin and consequently comes on earlier in life, being rare after the third decade.

The onset is sudden, associated with fever and usually preceded by joint symptoms. The condition is accompanied by evident signs of cardiac distress, rapid pulse, precordial pain, friction rub, limited diaphragmatic excursion. etc.

Cardiac Asthma. — I cannot bear to close this discussion without referring to that condition called cardiac asthma. It is usually not associated with pain, but the presence of evident cardiac distress has caused it to be confused in the minds of some physicians with angina pectoris.

In great haste in the middle of the night you are hurriedly called to the bedside of a middle-aged man who has been carrying an elevated blood pressure. You find him propped up in bed gasping for breath, fighting for air, lips cyanotic, lungs full of moist râles, pulse feeble and rapid, cold sweat on forehead. He begins to cough up pink to red-tinged froth. You believe he is going to die, so great is his distress.

The cause of this disturbance is that the left ventricle has suddenly given way under the load and the blood dams back into the lungs. This pulmonary stasis is further aggravated by the fact that the right heart is still vigorously pumping blood into the lungs.

Here nitroglycerine dilates the peripheral vessels and relieves momentarily the load on the heart while subcutaneous digitalis tones up the left ventricle again.

In cardiac asthma dyspnea is the predominant symptom, in angina pectoris pain, not dyspnea, dominates the picture.

When angina occurs with dyspnea as well as pain, it means serious myocardial damage and a grave outlook.

EIGHT ETHICAL IDEALS FOR PROFESSIONAL MEN

(1) The professional man should maintain a standard of competency in his own field, entirely apart from all considerations of public opinion or private gain. He may fall far short of his own standard, but he must never blur the distinction between good and poor work.

(2) The professional man should consider his compensation, in whatever form it may be given to him, as a secondary end; and he should not only be content with a modest income, but he should regard it as a part of his professional duty to make it clear to all concerned that a professional man is not interested in amassing wealth.

(3) The professional man should take a personal interest in recruiting for his own and for other professions the most promising of the youth of the nation, and he should take a corresponding interest in the problems of professional education.

(4) The professional man should deliberately cultivate honest criticism of his own and all other professional work, training himself to hate sentimental praise and ignorant faultfinding, and developing to the extent of his ability the difficult part of clear-sighted, constructive, critical judgment.

(5) The professional man should regard himself as a guardian of the public interests in every situation where he finds those interests in jeopardy, because this is his first obligation to the society which has given him his professional education and opportunity.

(6) The professional man should champion complete liberty of thought and expression, whether popular or unpopular, without yielding in the slighest degree his own convictions as to what is true or false, wise or foolish, right or wrong.

(7) The professional man should encourage the experimental spirit in every department of human affairs, because he knows that all human progress has come about by this method.

(8) The professional man should use every opportunity to promote better mutual understanding among men of different classes, creeds, nations, and races, recognizing that his education and experience should enable him to rise above all fears and hatreds, and to serve as an interpreter and peace-maker among men.

—Report of Committee on Ethics of Professional Men's Clubs. Frederick M. Eliot, Chairman.

BARE RADIUM TUBES IN THE TREATMENT OF TUMORS AROUND THE HEAD AND NECK*

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The implanting of bare radium emanation tubes directly into tumor tissue as a therapeutic measure marks a distinct advance in treatment by radiation. Since the use of so-called radium seeds was begun in the Mayo Clinic, about three years ago, approximately 150 patients with malignant tumors around the head and neck have been treated in this manner. Many of these lesions were extensive and fulminating. In many instances the condition appeared hopeless, and treatment was carried out with a view of palliating rather than with the hope of cure. In a number of instances treatment was instituted with the sole idea of trying out the bare tubes, as no other form of treatment was considered worth trying. The results have been extremely gratifying, in many instances a distinct surprise. A number of the patients with advanced malignant lesions have been markedly relieved, and even apparently cured. These results have not previously been duplicated in the clinic with any other form of radium or surgical treatment.

The use of the bare emanation tubes was first suggested by the physicist, Duane, who started working on the problem in Paris in 1908. In 1914, Stevenson, in the Proceedings of the Royal Society of Dublin, reported twenty-two cases in which good results were obtained. Shortly afterward the method was introduced into this country, where it was first used by the late Dr. Janeway in the Memorial Hospital, New York.

Method of treatment. — Small capillary glass tubes containing radium emanation are implanted directly into and around the periphery of the neoplasm. Radium emanation is a gas given off from the radium element and possesses the same radioactive properties as the radium element itself. It loses its activity at a uniform rate of about 15 per cent every twenty-four hours so that by the end of two weeks its action is practically nil. It is thus seen that a tube containing 1 mc. of emanation will, by the time it is exhausted, have given off approximately 132 mc. hours of radiation. The bare tubes or seeds measure approximately 0.3 by 3 mm. (Fig. 1), and are prepared by collecting the radium emanation in a long, capillary glass tube, which is then divided into the proper lengths by means of a gas flame which seals as it cuts. These tubes are embedded in the tissues by means of a long, slender, hollow needle fitted with a stylet, just within the end of which the seeds are placed and then forced into the tissues when the needle has been inserted to the proper depth. The tubes either slough out during the radiation reaction or become embedded in scar tissue. I have never seen them cause any trouble. The tubes can be thoroughly sterilized by carbolizing and the contents are practically sterile, so that no harm results should they become crushed accidentally in introducing. Seeds containing from 0.5 to 1 mc. of the emanation are preferred, as the experiments of Bagg have shown that the tissues in the proximity of each tube are thoroughly radiated by this quantity with a minimum of necrosis. Efficient radiation around such a tube is produced over a radius of about 5 mm., so that in the treatment of a neoplasm an attempt is made to scatter the tubes uniformly, approximately 1 cm. apart. Increasing the quantity of emanation in each tube increases the amount of necrosis but does not appreciably increase the extent or efficiency of the radiation. Formerly tubes containing 5 mc. or more were used, but these have been discontinued, for, owing to the extensive tissue necrosis produced, they tend to gravitate from the area where embedded and may lodge adjacent to large blood vessels or nerves, resulting in severe hemorrhage or unduly painful reactions. Heavy external radiation is given as a routine over the neoplasm and regional lymph nodes just prior to or immediately following the implanting of the bare emanation tubes, in order to lessen the possibility of grafting or metastasis.

ADVANTAGES OF THE METHOD

The embedding of these bare tubes in the tissues has a number of distinct advantages over other forms of radium treatment: (1) the radio-active substance is in much more intimate contact with the tumor than when applied in any other manner and more efficient radiation results with less radia-

*From the Section on Laryngology, Oral and Plastic, Mayo Clinic.

Read before the Southern Minnesota Medical Association, Owatonna, Minnesota, May 18, 1925.

tion of the surrounding tissues; (2) a much higher percentage of the radium rays are utilized than is otherwise possible, for the softer gamma rays, which are ordinarily lost by filtration, as well as the beta rays, are made use of; (3) lesions in areas where it is almost impossible to retain radium applied in any other manner are quite readily and efficiently treated; (4) less trauma is produced in introducing the tubes than by any of the other methods of burying radium, and (5) small areas of recurrence are readily taken care of by means of the seeds.

DISADVANTAGES AND LIMITATIONS OF THE METHOD

There are certain disadvantages in the use of the method which, however, are no greater than with the other methods of radium treatment, except possibly the surface applications, which it far surpasses in efficiency. The danger of hemorrhage must be considered whenever a destructive dose of radium is applied to any neoplasm in the proximity of large vessels, especially tumors of the tongue, floor of the mouth, pharynx, and hypopharynx. The radiation reaction following varies greatly. In an infected field, such as the buccal cavity, it is always quite painful and prolonged, sometimes lasting for several months. It appears to bear a direct relationship to the amount of secondary infection present. A minimal reaction follows the introduction of bare tubes into a subcutaneous tumor through the intact skin under strict asepsis. The puncture wound of the introducing needle heals promptly, sealing off the tumor to prevent infection, and the radiation reaction often is no more severe than that following the application of a heavy but less effective surface treatment. On the other hand, when an ulcerated lesion of the skin or mucous membrane is treated so that the tubes in being introduced pass through an infected area, carrying infection into the tumor, a rather severe and usually quite painful reaction follows. The same is true when the dose is sufficiently heavy to produce sloughing of a lesion on the skin, even though there was no ulceration primarily, as secondary infection invariably occurs. The reaction comes on, as a rule, after approximately two and one-half to three weeks, and lasts for several weeks. Often it takes two or three months for the slough to clear away entirely, especially if tubes containing more than 1 mc. are used. Needlessly severe and painful reactions have undoubtedly followed too intensive treatment, resulting from the desire to play safe in many of these cases. However, I have not encountered any untoward effects which could be definitely ascribed to overtreatment. As further experience permits of more accurate estimation of the dosage for a given neoplasm, the severity of the reaction and the amount of slough will probably be greatly reduced.

PRACTICAL APPLICATION OF THE TREATMENT

Treatment with bare tubes is primarily indicated in certain groups of malignant tumors, but in the clinic it is not being used to the exclusion of surgery in frank surgical cases. The procedure will be considered under three headings: (1) treatment of primary lesion with the bare radium tubes alone; (2) treatment of the primary lesion with surgery, supplemented by the tubes, and (3) treatment of the affected nodes.

Treatment of the primary lesion with bare tubes alone.—This type of treatment has been most effective in: (1) fulminating epitheliomas of the tongue, especially in young persons; (2) recurring, fixed epitheliomas in locations difficult of access surgically without destroying important structures, such as around the external auditory canal and the orbit; (3) lesions of the base of the tongue, oropharynx, nasopharynx, and hypopharynx; (4) recurring malignant growths in which the limits are indefinite; (5) malignant tumors of the nasal fossæ, and (6) malignant lesions when, on account of the patient's age or general condition, surgery is contraindicated.

Fulminating epithelioma of the tongue in young persons often strongly resembles sarcoma, clinically. It grows rapidly, is prone to recur locally and metastasize actively following almost any type of surgical treatment. Brilliant results have been obtained in certain of these cases by the use of the bare emanation tubes. Radiation is most effective in this rapidly growing type of epithelioma, and this, with the slight trauma produced in embedding the tubes, makes them a most satisfactory therapeutic agent. Especially striking results have been obtained in cases in which, besides the lesions of the tongue, conditions prohibiting surgical intervention were also present. In one instance, a young man, aged thirty, with an epithelioma of the left side of the tongue, infiltrating the adjacent floor of the mouth, which had been activated by repeated applications of caustic, was found to have also

marked myocardial degeneration and cardiac enlargement. Intensive radium treatment was given externally with distance and screening, and following this eight bare emanation tubes were implanted into and around the lesion on the tongue. The patient has now been entirely free from any evidence of carcinoma for a year and a half.

A number of recurring fixed epitheliomas in the mastoid and parotid region with extension inward along the external auditory canal, have been treated by these tubes. Complete surgical removal of such lesions is always difficult, and the proximity of the facial nerve adds to the problem. Facial nerve palsy has not been observed by me following the use of the tubes in this region.* In one case in which the neoplasm had caused complete seventh nerve paralysis, marked regeneration followed the recession of the growth produced by buried tubes. Again, epitheliomas of the skin invading the orbit are difficult to control with any type of treatment. Operation without exenteration of the orbit is, as a rule, of no avail. In one such case, the patient wished to try the emanation tubes in preference to operation, although advised that destruction of the globe would probably result. This patient has now been well for eighteen months and has had no impairment of vision in this eye.

Perhaps the most remarkable results from the use of the emanation seeds have been in the group of malignant lesions involving the base of the tongue and hypopharynx. A number of these were active, recurring lesions, whose limits could not be ascertained definitely. They were obviously not surgical, on account of their type, location, and indefinite extent. Radium treatment in this group was quite unsatisfactory prior to the use of bare tubes because of the difficulty of accurately applying the radium over the lesion with any assurance of its remaining there and sufficiently radiating the area without producing too much reaction in the adjacent structures. By means of special instruments I have devised (Fig. 2), tubes are quite readily implanted in the affected region. There is little likelihood that the tubes will become dislodged before the greater part of their radio-active influence has been exerted. One patient had a deeply ulcerated recurring epithelioma, about 1.5 by 2.5 cm., on the base of the tongue, extending onto the lateral wall of the hypopharynx, and a metastatic gland in the neck about 3 by 5 cm. Radium over the base of the tongue and externally had been applied elsewhere. In the clinic, nineteen bare emanation tubes, totaling 13.7 mc., were in-

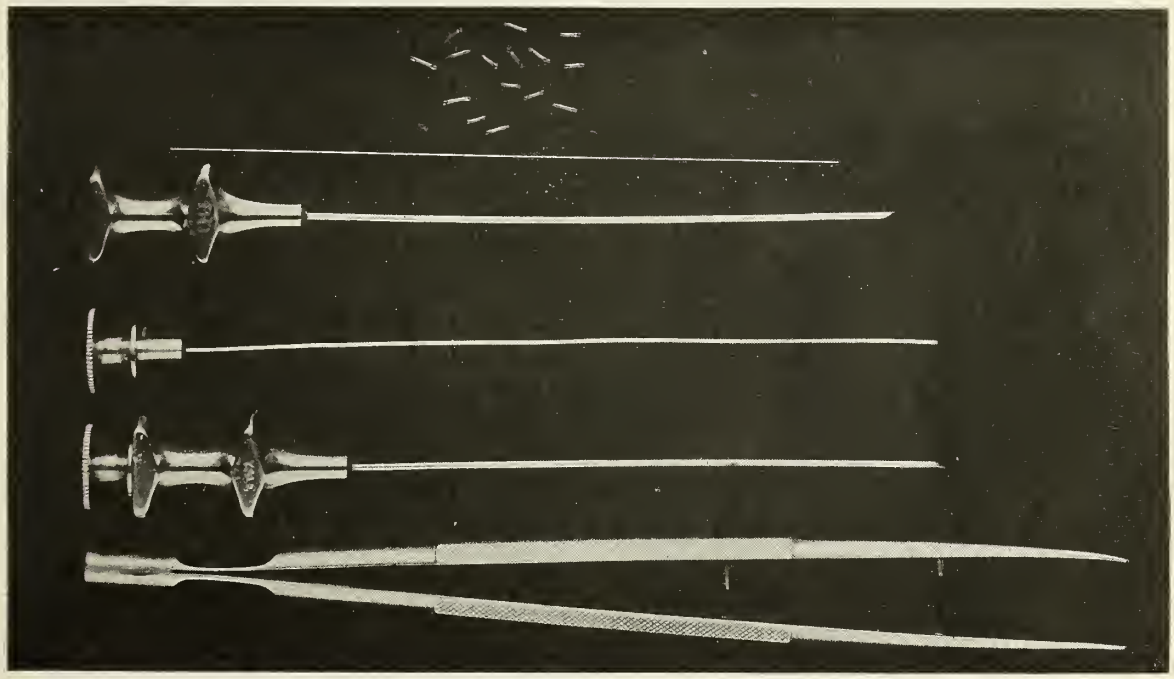


Fig. 1. Radium seeds with instruments used in introducing them.

*Since writing this paper I have seen one case of facial palsy following the use of radium seeds in a recurring epithelioma just below the floor of the external auditory canal.

serted into the lesion under local anesthesia. Radiation with distance and screening over the cervical region was then given. Immediately after this a block dissection was performed. The treatment was carried out a year ago, and there has been no evidence of recurrence either locally or in the nodes. In treating lesions in this location, one must bear in mind that besides the danger of hemorrhage, there is the possibility of abscess of the lung and pneumonia from aspiration of the slough. One such unfortunate experience followed the treatment of an epithelioma at the base of the tongue in a young man who developed fatal aspiration pneumonia. These dangers, however, are probably no greater following the use of these tubes than following former methods. In fact, more severe hemorrhages from this region followed the use of steel points or surface applications.

Malignant tumors of the nasal fossæ cannot, as a rule, be treated satisfactorily by surgery, and the prognosis is correspondingly questionable on account of their inaccessibility and the difficulty in determining their extent. The bare radium tubes are particularly advantageous in these cases, as they can be accurately placed with very little discomfort, and the effective radiation is fairly well confined to the desired area. A number of intranasal tumors have responded remarkably to this treatment.

The method has been used successfully when advanced age or general condition of the patients with malignant tumors has prohibited operative treatment. Epitheliomas of the mouth, complicated by pulmonary tuberculosis, cancers of the face of patients with serious cardiac disorders, and recently an epithelioma of the lower jaw of a patient with a previously unrecognized pernicious anemia, have been treated in this manner.

Treatment by surgery.—The method has been used to supplement surgery in the treatment of tumors of: (1) questionable operability in the parotid and mastoid region, with invasion of the external auditory canal; (2) extensive, inaccessible malignancies of the buccal cavity, and (3) lesions of indeterminate extent around the face, or in the accessory sinuses.

The method has proved a very useful adjunct to surgery in the treatment of malignant tumors involving the external auditory canal. The tubes can readily be implanted into the portion of the growth within the canal, far beyond the point that could be reached surgically. As a rule, it is preferable to destroy malignant lesions of the buccal cavity by diathermy, or the actual cautery, since this can be effectively accomplished under local and block anesthesia with little discomfort to the patient. However, the tubes are a valuable aid in these cases. After a thorough cauterization the tubes are inserted into any questionable areas, a combination of treatment which has greatly improved the end results. In cases of extensive malignant growths around the tuberosity of the superior maxilla extending into the retromaxillary fossa, the tubes have been used alone, or in combination with the cautery, with good results. The possibility of serious hemorrhage must be kept constantly in mind in dealing with tumors in this region during the period of reaction. Ligation of the external carotid artery may become necessary at any time. Severe bleeding has been encountered in a few of these cases, but routine ligation of the external carotid has not seemed necessary.

Treatment of the affected nodes. — Usually in cases of malignant growths of the mouth and pharynx the local lesion is removed, and, as soon as conditions permit, the regional lymph nodes are

TABLE 1

LOCATIONS OF LESIONS TREATED*

Upper lip	5
Lower lip	9
Cheek	4
Parotid	9
Nose (external)	5
Lower jaw	9
Eyelid	1
Orbit	2
Ear	6
Mastoid	4
Temporal	1
Tongue	22
Base of tongue	4
Lower jaw and cheek	10
Upper jaw and cheek	8
Floor of mouth	3
Buccal surface	6
Palate	6
Nasal fossa	6
Antrum	5
Pharynx, including tonsil	6
Nasopharynx	5
Hypopharynx	3
Metastatic nodes	6

*In most of the cases the lesion involved other areas as well.

dissected out. In the cases reported here, however, the prognosis appeared so unfavorable that excision of the nodes was postponed in most instances until the primary lesion could be controlled. The same course has been followed in a number of cases in which the lesion of the mouth was destroyed by the actual cautery or diathermy. However, the regional nodes have been radiated intensively, using distance and screening, and implantation of the tubes into palpable metastatic nodes directly through the skin. In a few cases, fixed, metastatic masses have been exposed, the radium has been implanted into the tumor, and the wound closed. The involved nodes are thereby effectively radiated, and since the seeds are implanted so far below the surface that very little radiation reaction develops in the skin itself, further treatment with distance and screening can be safely given over the remaining nodes as a prophylactic measure. The primary results in some of these cases have been quite satisfactory, but that more efficient treatment of the nodes is desirable is evidenced by the fact that a number of patients have died from metastasis after the local lesion had been well for over a year. The nodes were excised in a few cases, but not until metastasis was demonstrable clinically. Sistrunk has shown that deferring excision of the nodes until there is clinical evidence of metastasis, reduces the chances of cure approximately 50 per cent. In view of the excellent results in certain of these cases in the Mayo Clinic, the regional nodes are now being excised as a routine following the implanting of bare tubes into the primary growth. Better end results are anticipated.

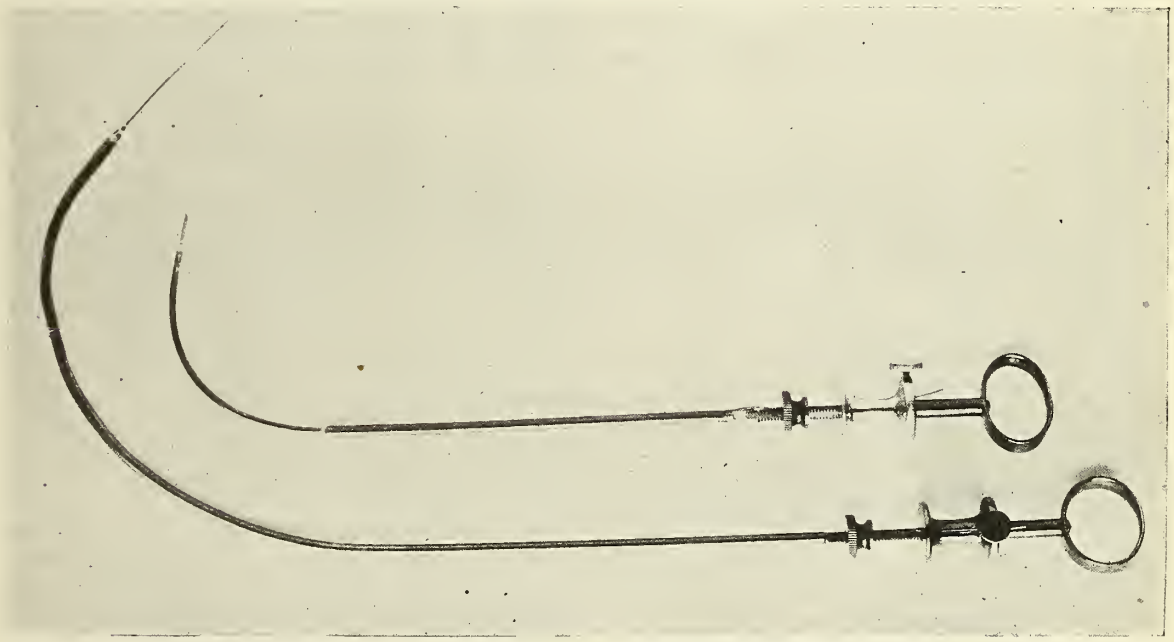


Fig. 2. Instruments used in introducing the seeds into lesions at the base of the tongue and in the larynx.

SUMMARY

The bare radium emanation tubes have effected remarkable primary results. They are of value when used alone in the treatment of the local lesion, following the surgical treatment of the local

TABLE 2

TYPE OF LESION

Basal-cell epithelioma	15
Squamous-cell epithelioma (not graded)	4
Squamous-cell epithelioma 1	4
Squamous-cell epithelioma 2	32
Squamous-cell epithelioma 3	27
Squamous-cell epithelioma 4	13
Basal-cell and squamous cell epithelioma	3
Epithelioma (clinically)	17
Carcinoma	11
Lymphosarcoma	2
Melanoepithelioma	1
Fibrosarcoma	1
Mixed-cell sarcoma	1
Cystadenoma	1
Adamantinoma	2
Giant-cell tumor	1

lesion, and in controlling the metastasis. In all of the cases in which the bare radium tubes alone were used, there was some contraindication to surgery. When used in conjunction with surgery, better results have been obtained than by surgery alone. The patients in this group cannot be considered cured, since none has yet been well more than two and one-half years, but it is quite probable that most of those who have now been free from recurrence for a year or more will remain well.

TABLE 3

RESULTS IN CASES OF MALIGNANT TUMORS OF THE TONGUE

	CASES
Tongue lesions treated over ten months ago	18
Patients not heard from	4
Patients heard from	14
Well	8
Well for two years	1
Well for one and one-half years	4
Well for ten months	3
Recurrence locally	1
Recurrence in glands	2
Dead	3
Dead without local recurrence (one and one-half years)	1
(seven months)	1
Type of tongue lesions	
Squamous-cell epithelioma 2	6
Squamous-cell epithelioma 3	8
Squamous-cell epithelioma 4	2
Epithelioma, clinical	1
Adenocarcinoma 3	1

BIBLIOGRAPHY

1. Bagg, H. J.: The action of buried tubes of radium emanation upon normal and neoplastic tissues. Am. Jour. Roentgenol., 1920, vii, 536-544.
2. Duane, William: Symposium on radium. Dosage, envelopes and duration of treatment. Med. Rec., 1920, xcviii, 581.
3. Janeway, H. H.: Treatment of cancer, particularly of the tongue, tonsil and rectum, by buried emanation. Am. Jour. Roentgenol., 1920, vii, 92-101.
4. Janeway, H. H.: The use of buried emanation in the treatment of malignant tumors. Am. Jour. Roentgenol., 1920, vii, 325-327.
5. Quick, Douglas: The value of interstitial radiation. Am. Jour. Roentgenol., 1922, ix, 161-166.
6. Sistrunk, W. E.: The results of surgical treatment of epithelioma of the lip. Ann. Surg., 1921, lxxiii, 521-526.
7. Stevenson, W. C.: The theory and technic of a new method of radium therapy: with notes on cases treated during the last nine months. Dublin Jour. Med. Sc., 1915, clix, 177; Tr. Roy. Acad. Med. Ireland, 1915, xxxiii, 145-167.

DISCUSSION ON DR. FIGI'S PAPER

Dr. Harry P. Ritchie, St. Paul, Minn.: In accepting the invitation to discuss this valuable paper on the particular form of treatment of cancer by the use of radium seeds I fear that I may do so under false pretenses, as my actual experience is limited.

There are very few men in the country who have access to this agent in this form, but it meets with my approval because it permits of surgical judgment in its use in that we may place these seeds exactly at the point of growth and its extensions. We must remember, however, that this is only one form in the treatment of cancer. Generally considered, there are only two ways of treating cancer: one by excision of the growth and the other by destruction in position. The latter includes a great number of agents—radium, *x*-ray, cancer paste, cautery, electrical treatments in a number of forms. The objection to this latter plan applies to all of these agents: an inability to determine results except by inspection. There is always the danger that the growth is only inhibited and not actually destroyed.

Excision, of course, is the positive way if the cancer is widely removed. It seems to me that this has the best chance for a permanent cure. The objection to this form of treatment is the possibility of loss of function or a deformity which will be extreme and therefore carries a great penalty. In surgical attack there is also the chance of making an incomplete removal and, of course, it is well known that such results only stimulate the growth. So I believe in the future that our program is not the discussion of the relative merits of these different agents, but the careful consideration of the case as to whether the new growth is a local one and whether it can be widely removed. This is the primary consideration. If there is danger of incomplete removal by reason of anatomical location the results of this procedure will leave the patient with some horrible deformity. In other words, limitation of surgery in the future will be more carefully considered and such procedure will not be undertaken unless there is more than a fair chance that the growth can be widely removed. Attempts to destroy in position through the surface application of radium and *x*-ray always appear to me as being entirely empirical. There is no assurance of accomplishment. Radium by far outstrips these other agents because we can collect it in such form that it can be used as a surgical agent. Rightly or wrongly in our efforts and opinion we can place this agent exactly where we decide it will do the most good. There is no question of its efficiency when we see the marvelous results of its action as shown in the case of the gentleman here presented. From the description of the surgical tumor this case was absolutely beyond the field of excision. And yet this case in my hands, and I am sure in others, has been subjected to the attempts of surgical removal.

In our discussion of these we must no longer use the poor results from treatment of one in favor of another, but must study the case from all angles to prove whether it is a local growth, not necessarily an early growth. I think "early" is the wrong term. What we are after is "local." We see these cases with a long history and yet every evidence indicates that the growth is still local. We see cases

of short history and yet present glandular involvement. So what we really want is not early or late, but a local growth. Then, it seems to me, the reasonable hope of a cure is its wide removal. Deciding that the growth is out of bounds or is anatomically so situated as to demand gross surgery, then I believe that we should consider these other agents of destruction with or without surgery.

One must come to some definite conclusion and mine at the present time is this—that the hope of a cure, not a three-year or a five-year, but a cure without qualification, is a local growth widely removed.

THE STUDENT HABIT

Many men who are masters of research, who force secrets from Nature by experiment, who prefer to glean their knowledge at first hand and are, I admit, the rarest and highest form of scholars, often despise the habit I wish to extol—the student habit. There have been, and there are, successful medical men who turn aside from books, who leave their medical papers unopened in their wrappers, who prefer to be guided in thought and action by what their fingers have felt and their eyes seen. If by neglecting the student habit they gain something, they also lose much, and it will go ill with their harvest of knowledge if their successors treat them in the same selfish way as they have done their predecessors.

I do not claim for my ideal student, Clifford Allbutt, that he was a pioneer who opened up great new fields of knowledge, but he attains to my ideal because he checked what he saw and what he suspected against the observations and the theories of the great minds that have paved the highways of medicine. Nature had endowed him richly, but he could never have done what he did nor been what he was unless he had acquired the student habit. I speak as an old student of ordinary ability, to young students born into the same happy estate, and I say that the acquisition of the student habit is one of the most valuable assets that a man or woman can carry into any line of life.—*Sir Arthur Keith, Lancet, Oct. 3, 1925.*

All our organs—our hearts, our lungs, our stomachs, and our brains—have been built to meet, not the daily routine of life, but emergencies which occur only at critical junctures. The heart on an occasion can rise to ten times its usual output; the lungs, if pressed, can do nearly as well. As for the stomach, the less said the better; modern civilization tends to throw an unfair burden on it. But as for the brain, the factor-of-safety law holds good; we have, and our ancestors had, about ten times more than ordinary occasions require; our superfluity was given us for emergency. It is just this emergency ration that the modern scholar has to depend on, and there are few, if any, of us who use this extra allowance to its full capacity. You may study to the utmost limit of your endurance, and by the mere act of study you may rest assured that you will do your brain no injury. Infinitely greater harm is done by misuse and disuse of the brain than by overuse.—*Sir Arthur Keith, Lancet, Oct. 3, 1925.*

URETERAL STONES*

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Ureteral stone is a problem of great importance because, first, it is the cause of painfully distressing symptoms; second, because its early removal prevents damage to the kidney which necessarily follows ureteral obstruction; and, third, because it lends itself to very definite diagnosis and localization. The recent work of Hinman on comparative renal function and the success in manipulation of stones by ureteral catheters have brought the question once more to the fore. Hinman, working on dogs, has shown that the recovery of function in a kidney when obstruction has been removed is always good, provided it has not existed too long. If complete obstruction of a ureter has existed over a period long enough to cause increased function in the kidney on the other side, the removal of the obstruction will not make the injured kidney return to normal functional activity because the hypertrophied kidney will continue to hypersecrete. If, however, the hypertrophied kidney is removed and the burden of the excretion is forced upon the impaired kidney, it will regain much of its lost function. This piece of work has changed our viewpoint on operative procedures in kidney and ureteral surgery and upon the importance which the differential functional test bears to them.

The development of roentgenology was undoubtedly the greatest single factor in rendering ureteral stone intelligently accessible to the surgeon. However, it took years of experience, countless operations and post-mortem examinations to differentiate the shadows of stone from the numerous other causes of radiographic shadows. Fecoliths, appendiceal concretions, calcified glands all give shadows which are similar in many respects to the shadows of ureteral stone. Phleboliths are undoubtedly the most frequent cause for confusion in diagnosis. Their round shape, sharply defined borders, and arrangement in chains along the course of the lower ureter, often prove extremely confusing, and when roentgenology was in its infancy many patients were operated for indefinite pains, because of the presence of these shadows, and no stones were found. At the Roentgen Con-

*Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, April, 1925.

gress in 1905 the cause of these shadows was discussed but their etiology was not definitely settled. Calcified ligaments, fecoliths and phleboliths were all suggested as causes but it was not until G. O. Clark in 1908 dissected a prostatic plexus containing 18 phleboliths from a cadaver which previously had given shadows in roentgenograms of the pelvis that the matter was settled. A roentgenogram of the plexus after it had been removed showed the same shadows, while a post-mortem roentgenogram of the cadaver was negative. This proved definitely that phleboliths were the cause of many of these shadows, with the result that surgeons began to demand more than a radiographic shadow as an indication for operation.

The diagnosis and localization of ureteral stone today is very accurate. The history may be quite variable. The pain may be a severe renal colic with typical radiation associated with frequency, dysuria or hematuria, or it may be a dull ache of several years duration. Physical examination reveals but slight or no elevation in temperature, tenderness over the abdomen and in the lumbar region on the affected side. The hammer percussion sign may be present or absent. Microscopic pus and blood are usually found in the urine.

A roentgenogram of the kidneys, ureters and bladder, taken after catharsis, usually shows a suspicious shadow somewhere along the course of the ureter. The commonest locations of the stone shadows are at the bladder wall, the uretero-pelvic juncture and the brim of the bony pelvis.

The appearance of the shadows is quite variable, measuring anywhere from two or three millimeters in diameter to ten or twelve centimeters. They are usually oblong in shape with rounded corners. This is, however, by no means constant as they may be round, triangular or irregular. They are usually more dense than shadows caused by fecoliths, calcified glands and pelvic tumors and less dense than the shadows of phleboliths, which are usually round with sharply defined borders and occur in chains.

Certain stones, however, are permeable to the roentgen ray and therefore do not cast radiographic shadows. Newly formed stones do not cast shadows because of their size and molecular structure. These, however, usually pass spontaneously and give very little trouble. Stones composed of pure cystin, xanthin or uric acid give no radiographic shadows even though they are large. This should always be kept in mind and if a good history for stone is obtained, even in the face of a negative roentgenogram, further study should be made to demonstrate the presence of stone.

Cystoscopy and pyelography are the two methods at our command for accurate diagnosis and exact localization of ureteral stone. A stone at the bladder wall may sometimes be seen protruding from the ureteral orifice or the meatus itself may bulge into the bladder even though the stone cannot be seen. Obstruction to the ureteral catheter is another bit of corroborative evidence though it should be remembered that spasm, stricture and anatomic obstruction will all prevent the passage of catheters so that obstruction alone is not conclusive evidence of stone. If the catheter is passed beyond the stone and a definite feeling of grating obtained it may be considered definitely diagnostic. The method of localization with the lead catheter is being gradually replaced by the more exact method of pyelography. The lead catheter even when stereoscopic plates are used is by no means accurate. Only too frequently the shadow of the lead catheter is superimposed on the shadow in question, which makes it impossible to say if the shadow is intra-urinary. Then too in a dilated ureter it is not uncommon for the shadow of a ureteral stone to be at least one centimeter away from the shadow of the lead catheter, which will again lead to a mistaken interpretation.

A pyelo-ureterogram will definitely determine the intra-urinary nature of a suspicious shadow. Braasch in his book on pyelography points out that the shadow of a ureteral stone will always be completely included in the outline of the ureterogram which is characteristically deformed, either by nodular dilatation at the site of the stone, diffuse dilatation extending up to and including the renal pelvis or by complete obstruction to the media with no outline of the ureter above the original shadow. We have, therefore, a method by which we can definitely diagnose and localize stone in the ureter so that there shall be no uncertainty as to its location at operation. It should be remembered, however, that ureteral stones may change their position in a very short time. A roentgenogram taken the morning of the operation will disclose if the stone has remained in the same place as when the patient was examined cystoscopically.

The best method of approach for removal of a ureteral stone requires considerable experience. However, a fairly good general rule for determining the procedure is that stones measuring more than one centimeter in diameter should be removed by an open operation, while stones measuring less than one centimeter in diameter are at least worthy of an attempt at removal by manipulation with multiple ureteral catheters. There are, however, certain exceptions to this rule. If the patient has passed stones previously from the ureter in question, he has a chance of passing subsequent stones much larger than one centimeter in diameter. Approximately 70% of all patients with ureteral stone at the Mayo Clinic, upon whom manipulation is attempted, are successfully treated by this method. The technique consists in the introduction of as many catheters as possible into the ureter beyond the stone. Three and sometimes four catheters may be introduced. The cystoscope is withdrawn and the catheters are allowed to remain in place for forty-eight hours. At the end of this time novocain and papaverin are injected into the ureter to cause as much relaxation as possible. In cases where the stone is in the bladder wall sacral anesthesia affords the most relaxation. After ten minutes a lubricant of oil is injected. Then the catheters are slowly withdrawn by a twisting motion. Occasionally the stone is brought out in the meshes of the catheters. More commonly it passes within the next forty-eight hours following their removal. If one attempt proves unsuccessful a second manipulation may be tried. If this too is unsuccessful an open operation is advisable. The results following removal either by manipulation or by open operation are excellent.

Stones situated at the bladder wall may be delivered by ureteral meatotomy. This procedure should be carried out under sacral anesthesia. Bumpus has recently described a meatotomy scissors which is undoubtedly the best one yet devised. It is made with a stiff shank and has a LaForte filiform mounted on one blade for directing it into the ureter. Cutting the intra-mural portion of the ureter with this instrument permits the successful manipulation of many stones which otherwise would have to be removed by surgery.

Manipulation is not without its dangers. Occasionally following the removal of the catheters complete obstruction results, due to spasm, with severe colic resulting. The already infected urine may set up a pyelonephritis with high temperature, chills and vomiting. When this occurs the catheter should be replaced for drainage. If this is impossible open operation is indicated.

Where the obstruction to the ureter has existed for so long a time that its function has been greatly impaired and the other kidney shows definite increase in dye excretion with the differential functional test, a nephrectomy should be considered because the kidney which has become accustomed to performing all the work will continue to do so and the impaired kidney will continue on its way to complete atrophy. If the stone can be removed at the same operation without too much difficulty, it should be done. If not, it may be left in the blind ureter and no fears may be entertained from it.

CONCLUSIONS

1. The development of roentgenology was the greatest single factor in rendering ureteral stone intelligently accessible to the surgeon.

2. There are many causes of roentgenographic shadows similar to the ones cast by ureteral stone.

3. The lead catheter cannot be relied upon in the diagnosis of ureteral stone.

4. We have at our command in pyelography a means for definite diagnosis and localization of ureteral stone.

5. Stones measuring less than one centimeter in diameter are worthy of an attempt at removal by manipulation. Stones measuring more than one centimeter in diameter usually require an open operation.

6. Stones located in the bladder wall may sometimes be removed by ureteral meatotomy under sacral anesthesia.

7. Where obstruction to the ureter has existed so long that the function has been markedly impaired and the other kidney is hyperfunctionating, nephrectomy is indicated.

THE DIAGNOSIS OF RENAL TUBERCULOSIS*

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The data reported in this paper were obtained from a study of one hundred histories and patients observed at the University Hospital, University of Minnesota, at the Glen Lake Sanatorium for Tuberculosis, of Hennepin County, and from patients observed and treated at the Nicollet Clinic, of Minneapolis.

The diagnosis of renal tuberculosis may be discussed under six headings: (1) clinical history and findings, (2) urinalysis, (3) urologic study, (4) roentgenographic data, (5) animal inoculation, (6) differential diagnosis.

CLINICAL HISTORY AND FINDINGS

In my experience over 95 per cent of all patients having renal tuberculosis complain primarily of acute cystitis. This is not relieved by treatment and is continuous throughout the disease. One exception to this statement occurs when the ureter becomes occluded by stricture, which may prevent urine from reaching the bladder so that it may never become infected, or, if infected, it may recover following complete ureteral stoppage. In early renal tuberculosis, symptoms of cystitis may be present without demonstrable lesions in the bladder. Cases have been reported wherein no symptoms were observed and wherein no findings were reported in the bladder. In such instances the resistance of the patient against tuberculosis is so great that lesions in the kidney are quickly encapsulated before destruction or suppuration occurs so that the lower urinary tract is never involved.

In a small number of histories, I find *hematuria* mentioned as the first symptom. In some, hematuria is the only symptom during the onset of the disease.

Renal *pain* is rarely, if ever, a primary symptom of renal tuberculosis. When occlusion occurs because of ureteral stricture, pain similar in character to that found with any ureteral obstruction may be noticed. Aching in the loin may be present when perirenal infection occurs. Aching over the sound kidney is thought to be caused by hypertrophy of this kidney which is quickly taking on the work of its disabled mate.

Renal *tumor* which occurs in 3 per cent is not a frequent finding and is infrequently discovered by the patient. It is caused by ureteral obstruction so that retention in the kidney pelvis results.

Palpation. When palpation of a tuberculous kidney is attempted, definite enlargement is infrequently discovered, even when the kidney is larger than normal. Slight difference in size may not be determined. Tenderness on deep palpation, particularly if the perirenal tissue is involved, is a frequent finding. The bladder is usually tender to deep pressure. In the female the ureter can be felt as a distinct cord which is extremely tender. This finding is not noticed in the early cases.



Fig. 1. Injected radiogram of the left kidney which revealed a very early lesion of tuberculosis. This is a cortical abscess which opened into the upper calyx.

Lesions of tuberculosis elsewhere. In my experience 85 per cent of patients with renal tuberculosis have some demonstrable lesion active or healed in the lungs. Tuberculosis of bone is next in frequency and is found alone or associated with pulmonary tuberculosis in 28 per cent. Tuberculous glands are found in 16 per cent. As renal tuberculosis is a blood-borne infection in practically

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every instance, the finding of lesions in the lungs or elsewhere during a general survey should make one think of renal infection as a possibility. A careful study of the urinary tract in the presence of tuberculosis elsewhere will reveal many unsuspected cases.

Lesions of tuberculosis in the lower urinary tract may be the only finding, during a complete physical examination, which indicates the presence of tuberculosis. The examination of the prostate, vesicles, vas and epididymis should always be made a part of general physical survey. A surprising number of patients with tuberculosis of the epididymi and prostate have a renal lesion which is



Fig. 2. Injected radiogram of the opposite kidney, which is normal. Sodium iodide withdrawn from the infected kidney with a syringe. The radiogram reveals retention of the sodium iodide in the cortical abscess.

easily overlooked unless the kidneys are carefully and repeatedly examined. Recently, I observed one patient who had thickening of the left vas deferens without a demonstrable lesion in the epididymis or prostate. Repeated examinations of the kidneys revealed tuberculosis of the left side.

Urinalysis: The characteristic urine in renal tuberculosis is turbid with low specific gravity and contains few other organisms. In the bladder urine, gross blood will be found in 20 per cent and microscopic blood at some time during the disease in 75 per cent. If renal occlusion occurs, pus or blood may never be present. Pus is present in the urine in over 95 per cent of patients. Pus may be present in the urine during one examination and not another.

Tubercle bacilli are found in smears made from bladder urine in 77 per cent, and, if carefully searched for, in 93 per cent of ureteral specimens. One negative smear does not mean that the urine is free from organisms. Large specimens of urine should be centrifuged and several smears made. If secondary infection occurs, tubercle bacilli may be present without being found on smears. I have used the alcohol precipitation process during the last few months, which has made my smear examination easier and has produced more positives. Catheterized urines should be obtained when possible. The smegma bacillus, in my opinion, does not have to be considered if care is taken when the specimen is obtained and if careful and correct counterstaining is done. When large amounts of pus are encountered, the organisms are present in larger numbers. Dr. N. A. Alcock in a recent article finds that both pus and tubercle bacilli occur sporadically in the urine so that he does not cystoscope his patients during the interval when no pus is found. This writer finds that the injection into animals of a specimen of urine obtained from a patient during an interval when pus is not present may not produce tuberculosis. I have watched two patients with bilateral renal tuberculosis for two years. It is quite common to find the urine negative for bacilli and pus at one time and find both present at another. Guinea pig inoculations have been negative two times.

The finding of tubercle bacilli in the urine, in my experience, indicates an active lesion of tuberculosis some place in the urinary tract. This lesion is most often in the kidney. At present a difference of opinion exists concerning the possibility of tubercle organisms passing through the kidney without producing damage or without a lesion being present. My opinion is that clinical evidence does not substantiate the theory that tubercle bacilli can pass through the kidney without producing some lesion. In only one instance did Braasch find a normal kidney following a diagnosis of unilateral renal tuberculosis based on the guinea pig inoculation.

Recently I removed a kidney for tuberculosis which has to date no gross or microscopic evidence of this disease. The entire kidney will be serially sectioned for evidence of minor individual lesions. I have watched this patient for the last three years,



Fig. 3. Injected radiogram. The left kidney contains many cortical abscesses which have broken into the pelvis. The pelvic outline is irregular. On the right side the normal kidney was injected for comparison.

during which time a number of cystoscopies have been done and tubercle organisms have been found repeatedly both by smear and after animal inoculation. This patient has the usual history which is found with renal tuberculosis. She had a pulmonary lesion which is now healed and inactive. The urinary symptoms have not cleared up in spite of her good general condition, so that the infected kidney was removed.

The work of Medlar and Sesano indicates that individual tuberculous lesions of the kidney may heal, although they find this condition rare. They have found lesions in the kidneys of animals which are small and cannot be discovered unless the entire kidney is sectioned. These writers conclude that no evidence is at hand which supports the theory that a normal kidney can excrete tubercle bacilli.

UROLOGIC DATA

The diagnosis of renal tuberculosis is always made from the data obtained during a urologic examination. The history may indicate that this condition is present and the urine may be positive for tubercle bacilli but the urologic study is necessary to locate the lesion and determine its extent.

The majority of patients with renal tuberculosis have a very irritable bladder, which very infrequently permits the passage of a cystoscope without general or caudal anesthesia. Caudal anesthesia has been of great assistance to the urologist, particularly when examining tuberculous bladders. I know that caudal anesthesia has made it possible for me to cystoscope many patients satisfactorily that could not have been done with general or local anesthesia. During caudal anesthesia the bladder reflex is controlled for a sufficient length of time so that cystoscopy can be done painlessly and thoroughly.



Fig. 4. Injected radiogram which reveals a total destruction of the kidney.

There is no other condition in the urinary tract that produces the severe bladder lesions that are found with tuberculosis. One must remember, however, that the patient's resistance may be high and will control the lesions in the kidney so that little

or no bladder symptoms are noticed. A stricture of the ureter may prevent tubercle organisms and pus from infecting the bladder.

An atypical history, together with few urinary findings, may cause one to overlook the diagnosis in spite of careful clinical examination. Braasch has described "silent" renal tuberculosis wherein symptoms usually found are absent and wherein the urological and urinary findings are negative.

The bladder in early tuberculosis may have but slight redness around the infected ureteral meatus with some swelling. The urine from the affected side is usually turbid and comes into the bladder in frequent spurts. As the condition progresses, the inflammation involves the whole bladder and later ulceration begins. The ulcers are angry looking irregular outlined areas situated any place in the bladder. They are not raised and infrequently, if ever, have a raised or depressed edge. They bleed easily and frequently are covered with a very thin slough or membrane. When ulceration occurs, the bladder contracts to small capacity and becomes very tender. The affected meatus dilates and eventually a golf hole appearance is observed.

Tuberculous inflammation and swelling of the bladder may resemble low-lying carcinoma. If the bladder is thoroughly dilated during cystoscopy, the differentiation is easily made. If doubt exists after thorough examination, a specimen may be removed for microscopic study.

Because the bladder contracts and loses its usual shape the location of the ureters and particularly the sound one may be abnormal. When the location of the meati is difficult, I use large intravenous doses of indigo-carmine which may be repeated if necessary. This dye not only colors the urine so that it may be easily seen as it spurts into the bladder, but frequently the mucosa surrounding the opening is stained blue.

Ureteral catheterization is usually easy unless a stricture of the ureter is encountered. This condition which is found in 45 per cent of patients with renal tuberculosis may prevent the passage of the catheter when it is complete, or if partial may require the use of the smallest catheter. When such an obstruction is passed the urine flows rapidly. If the ureter has been occluded for a long period so that the kidney is destroyed, the secretion may be thick pus which cannot pass through a catheter. The urine from a tuberculous kidney flows more rapidly than from the sound side and is turbid and flocculent.

Much has been written and much discussion is made concerning the possibility of carrying infected urine in or on a ureteral catheter into a sound

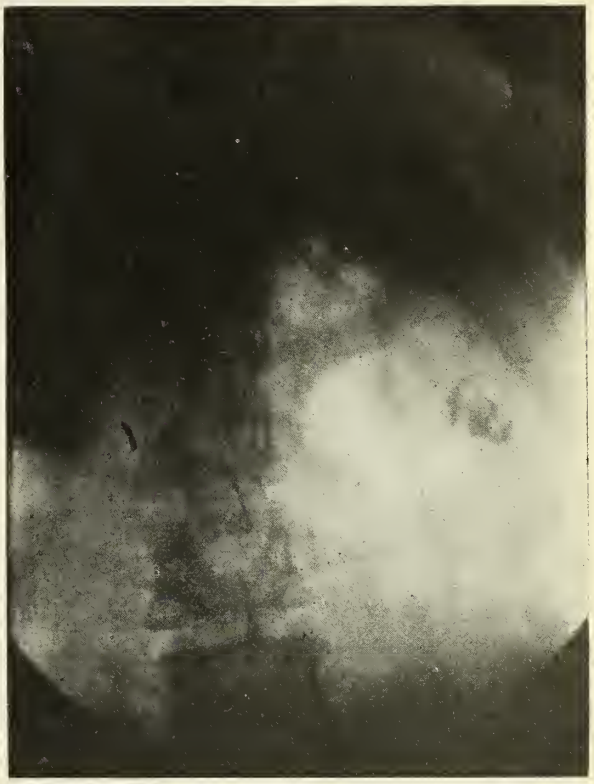


Fig. 5. Roentgenogram which reveals typical shadows produced by calcification in advanced tuberculosis of kidney.

kidney pelvis and thus produce tuberculosis. The constant irrigation of the bladder during cystoscopy, together with the precaution of forcing sterile water or some mild antiseptic through the catheter as it is being passed through the bladder and into the ureter, should prevent this.

To prevent contamination of the ureteral specimen of urine, some urologists fill the ureteral catheter with sterile water, then seal the outer end with a pin before introduction into the ureter. The pin is withdrawn after the catheter passes into the kidney pelvis and about 5-10 c.c. of urine and fluid is allowed to run away before the specimen is collected. Many observers claim false positives from smears and after animal inoculation because of contamination of the catheter during its passage through the bladder. This will not happen if the above precautions are observed. It is possible for

reflux to occur if the valve at the ureteral meatus is incompetent due to ulceration or inflammation. When this occurs, the findings with the ureteral catheter, together with the urinalysis of catheterized specimens, must be evaluated accordingly.

In early tuberculous infection of the kidney, the dye tests are of little or no value. When one or both kidneys have been partially or completely destroyed the dye may be delayed from one or both sides.

From my experience and from the experience of others who have searched carefully for infection in both kidneys, I am of the opinion that bilateral infection occurs very frequently. Some observers hold that in every instance the infection is hematogenous in origin and is primarily bilateral. Some urologists find reflux a frequent cause of infection in the second kidney. When infection occurs through the blood stream, the supposed sound kidney heals after a small primary lesion is present or the lesions that are present may be encapsulated and located so that they do not produce pus or tubercle organisms in the urine. Alcock, who made a careful urologic study of his patients with renal tuberculosis, found bilateral infection present at the time of examination in 47 per cent. In this series I find bilateral infection present in 41 per cent. I am sure that the number of bilateral infections will increase as further data accumulate. Braasch and Scholl found that 34 per cent of their supposed unilateral cases died in one year following nephrectomy. A number of these deaths were undoubtedly caused by infection in the remaining kidney. Medlor and Sesano in their experimental work, find renal tuberculosis bilateral in 88 per cent.

Pyelographic data have assisted me in the diagnosis of renal tuberculosis in a great many instances. In 27 per cent pyelographic data were a factor in arriving at a correct diagnosis. In suspicious cases, I have found pyelographic evidence of tuberculosis several times in which the smears were negative. The deformity may be slight in one minor calyx only or all calyces and the pelvis and ureter may be involved. The early lesions that I have observed are erosions at the tip of the calyx which are irregular and rough in outline. This evidence of cortical necrosis is typical of tuberculosis. As the process continues, the cortical lesions enlarge and the calyces are dilated so that the outline of the pelvis consists of large abscess cavities connected to the pelvis proper by large dilated calyces. The pelvic outline may be entirely destroyed so that only a pyonephrotic sac is seen.

The pyelogram has assisted greatly in following the destructive process that may take place in the kidney after the first small cortical abscess can be visualized. Among the lantern slides which I present today are two which demonstrate that a kidney was completely destroyed in only three months. The first slide shows a small lesion in one calyx. The second one a large pyonephrosis. When patients have other lesions of tuberculosis which may contraindicate operation (unless a kidney is entirely destroyed) or when doubt exists concerning infection in the other kidney, it may be necessary to watch the progress in the kidney that is known to be tubercular. A well filled pyelogram will give one a better idea of the amount of destruction than the amount of pus in the urine or the data obtained from functional tests.

ROENTGENOGRAPHIC DATA

The original roentgenogram will reveal shadows over the infected kidney in 25 per cent of instances. The shadows are typical of tuberculous calcification. They are usually multiple, small and may not cast as distinct a shadow as a renal stone. The shadows are grouped and have an irregular outline with areas wherein the density of the shadows is different. If calcification has been general throughout, a cast of the kidney pelvis may be seen. These shadows are caused by calcium deposit, which is a late stage of healing with tuberculosis and occurs as a late finding.

Animal Inoculation: Animal inoculation furnishes the urologist with a laboratory test for tuberculosis which is practically free from error. The guinea pig reacts much the same as man does to tuberculosis. If tubercle bacilli are injected the animal will develop tuberculosis in six to eight weeks. A healthy stock of pigs should be selected. All animals before being injected should be examined for large glands and other signs of disease. Some laboratory workers test all animals with the ophthalmic test for tuberculosis before they are used. Two pigs should always be injected for controls. Many observers have reported errors in the guinea pig test. If specimens are carefully taken and carefully injected, errors will not occur. When negative pigs are reported in cases which later are found to be positive, the urine which was injected was obtained when the kidney was not

eliminating organisms. Repeated tests should be made when doubt exists. The urine should be injected as soon after it is obtained as possible.

Differential Diagnosis: The acute onset with symptoms of cystitis which is uncontrollable by treatment is typical of renal tuberculosis. Every patient with such a history should be considered a sufferer from renal tuberculosis until this diagnosis is disproved.

Tubercle bacilli may be found in 93 per cent of catheterized ureteral urines so that this organism should be searched for repeatedly. This finding clinches the diagnosis.

The repeated introduction of suspected urine into a guinea pig will reveal tuberculosis if it is present.

Cystitis produced by other organisms may be hard to differentiate. With infections other than tuberculosis the condition responds to treatment in most instances, which is not the case with tuberculosis.

Bladder carcinoma may be confounded with tuberculosis in rare instances. When this occurs a specimen removed for microscopic study will differentiate the two conditions.

When complete stricture of the ureter occurs with a unilateral infection, the diagnosis may be very difficult. The history of a severe cystitis which healed spontaneously together with stricture of the ureter is presumptive evidence of the presence of renal tuberculosis.

The typical shadows produced by calcification and found with healing tuberculosis will be infrequently confused with renal stone.

The pyelogram is typical of tuberculosis, particularly the early small cortical abscess. If healing is in progress when no calcification has occurred, the pyelogram may be hard to differentiate from other conditions.

Renal neoplasm will not cause trouble in differentiation from tuberculosis.

Evidence of tuberculosis elsewhere in the body frequently assists in making a diagnosis. Tuberculosis in the genital tract means renal tuberculosis in the majority of instances.

The resistance of the patient may control this infection so that an atypical history is obtained and the finding may be so unusual that a correct diagnosis cannot be made except after operation.

CONCLUSIONS

1. The diagnosis of renal tuberculosis is not easy and is being overlooked in many instances. This occurs when the patient has good resistance so that the usual symptoms and findings are not present.

2. The first symptoms are those of cystitis.

3. Urologic examination is necessary before a diagnosis can be made.

4. The original roentgen ray will assist in the diagnosis in 25 per cent.

5. The pyelogram may show definite evidence of pathology when the smear is negative and is a factor in the diagnosis in 27 per cent.

6. Bilateral infection occurs in at least 47 per cent of patients infected.

7. Finding tubercle bacilli in the smears clinches the diagnosis.

8. When doubt exists, inject the urine into animals repeatedly.

9. Renal tuberculosis is secondary to tuberculosis elsewhere in the body and should be considered a local manifestation of a general disease.

10. Renal tuberculosis may be differentiated from other lesions of the urinary tract by finding tubercle bacilli in urine in 93 per cent, by *x*-ray evidence in 25 per cent and pyelogram in 27 per cent. Tissue examination will be positive if carcinoma is present. Evidence of tuberculosis elsewhere in the body is present with renal tuberculosis in 90 per cent.

BIBLIOGRAPHY

1. Alcock, Nathaniel G.: One hundred forty-five cases of renal tuberculosis. Transactions of the Am. Assoc. of G. U. Surgeons, Vol. XVII, 1924.
2. Braasch, W. F.: Occluded renal tuberculosis. The Journal of the Am. Med. Assoc., Nov. 13, 1920, Vol. 75, pp. 1307-1309.
3. Braasch, W. F., and Scholl, A. J.: Possible errors in the diagnosis of renal tuberculosis. The Journal of the Am. Med. Assoc., March 1, 1924, Vol. 82, pp. 688-692.
4. Medlar, E. M., and Sasano, K. T.: Experimental renal tuberculosis. The Am. Review of Tuberculosis, Vol. X, No. 4, December, 1924, pp. 370-391.

DISCUSSION ON PAPERS OF DRS. CULLIGAN AND THOMAS

Dr. Franklin Wright, Minneapolis: When I was asked to discuss this subject I did not understand that I was to discuss the group of papers, but thought it was to be only that of Dr. Braasch. I did not hear the first paper and heard only a part of the second. Dr. Thomas' paper covers the condition very thoroughly, but there are some discrepancies. He states that the earliest symptom of tuberculosis of kidney is an acute cystitis. That is not true. Tuberculosis of the kidney is essentially chronic. The earliest symptom is an irritable bladder, not cystitis. Another contradictory statement was that if a man has tuberculous epididymitis he may have tuberculosis of the

kidney and this should be investigated. A little further on he says that a man's kidney should not be investigated on suspicion. If he has a tuberculous epididymitis, with no symptoms from the bladder, investigation of his kidney would be on suspicion.

Regarding the antiseptics I have very few words to say. The majority of new antiseptics that are introduced to the medical profession are not introduced by the profession, but by laboratory workers, working for pharmaceutical houses which want something to sell. They hunt around for something that differs a little from something that is already in use. They try it on an animal and find it does not kill it, and then they send it wholesale to the profession throughout the country. For some reason or another the profession is afraid to tell these people that the preparations are no better than those in use, and so we have the reports we have heard this afternoon. The man who first wrote about acriflavine a year later was saying the same things about something else. On his report the manufacturers have deluged the profession with acriflavine and it is being used all over the country.

Now, regarding the use of urotropin. The first thing is that urotropin has, I believe, a definite, fixed place and is useful. The other thing is that it also has a definite toxic effect, which is manifested clearly and should be known by everybody who has used it. Some patients cannot take urotropin because it irritates their bladder. That is a local effect, not toxic. When a patient becomes toxic on urotropin this is manifested by the urine becoming smoky. If it is not stopped at that time the patient will go on and develop a definite hematuria. If it is allowed to go on he will pass degenerated blood, and if allowed to go on still further he will die and the pelves of the kidneys will be found to he filled with this dark brown degenerated blood. How do I know this? When it first came out I had this experience and when the patient died we had a postmortem.

One other thing, Dr. Braasch spoke about the difficulty of getting acid urine. The urotropin does not give off its formaldehyde unless the urine is acid. Very frequently, no matter what you use, it seems impossible to get it acid. In these cases I depend on the mineral acids. I believe dilute nitrohydrochloric acid will always make urine acid. It should be given 12 to 20 drops well diluted in water, three times a day.

Dr. Gilbert Thomas, Minneapolis (closing): In preparing a paper of this kind, several things are necessary. First, to stay within the fifteen-minute limit. I think if Dr. Wright will take time to read my paper he will find that we agree on most things. I do not hope to live long enough not to make errors.

I think Dr. Foley's paper should be discussed. Anyone who sees a great number of kidney cases will appreciate that the anomalies of the upper urinary tract are numerous. Some years ago, Dr. Foley gave us a very good paper on "Kidney Anomalies." Today he worked this subject up a little further and has given us another good paper. He did not have time to show all of his slides, which would have permitted him to bring out many important points which were not covered in his paper. I have a few slides that I will show you instead of discussing the paper further. (Presented series of slides.)

FRACTURE OF THE PATELLA*

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Fracture of the patella, while not as common as a great many other fractures, is of sufficient importance to be reviewed occasionally. Outside of textbooks on fractures there have been but few articles on this subject during the past ten years. As to the number of patellar fractures, Roberts and Kelly had 2 per cent in 1,393 fractures of all bones. Speed's fracture work at Cook County Hospital showed 1.67 per cent of patellar fractures. Scannell found fractures of the patella at the Boston City Hospital for forty years to be 1.7 per cent of all fractures treated there; of these 882 fractures only 11 were open or compound. Moorhead reports sixty-one cases, a percentage of 1.2.

Cause.—Most writers stress muscle action as the important cause of strictly transverse fractures of the patella, and claim that a direct blow usually causes an irregular or a comminuted fracture. They also claim that a fracture caused by a direct blow does not result in much separation of the fragments because the fascia is not torn. Cotton says, "The transverse fractures are nearly, if not quite always, the result of muscle action, and most often of that sudden, very powerful muscle action exerted to save oneself from a fall. With the knee bent at say 60 to 90 degrees the patella is held by the ligimentum patella firmly down and against the condyles, while the full pull of the strongest muscle in the body is suddenly exerted at its insertion on the top of the patella, well out of line with the fulcrum, namely, the convexity of the condyles, and the result is a fracture, approximately transverse, at or about the part of the bone resting on the fulcrum. But this is not all, or the most important part; the force continues to act, and the lateral expansions of the quadriceps tendon—in which the breaking patella has started a rent—tear widely out to either side; the whole extensor apparatus is gone, and there is no hindrance left to oppose separation of the patellar fragments."

Scudder says, "The 'tear' fracture will be transverse and clean cut, the 'blow' fracture comminuted and irregular."

Kellogg Speed says, "The greater percentage of all breaks with the customary transverse line of

*Read at the midsummer Range meeting of the St. Louis County Medical Society, August 8, 1925.

fracture in the lower portion are due to indirect violence. . . . With the leg semiflexed the patella lies at the highest point of the condyles of the femur in a position of weakness and non-support on the intercondyloid fossa. Sudden strain from flexion of the leg or contraction of the quadriceps will thus tend to snap the patella, and tear the ligaments. Comminuted, stellate, and some oblique fractures are due to direct violence and are of infinite variety. They may follow simple transverse fractures with a subsequent fall furnishing direct violence to comminute the bone."

Moorhead says, "Muscular violence is generally regarded as the more usual origin and this generally takes the form of a sudden bending or twisting of the knee in an effort to regain balance to prevent falling after tripping or stumbling; or where some strong pushing force continues to overbend the knee with the limb more or less rigid. Direct violence in which the knee-pan is struck or impinges against an object is a less usual source." However, in several of the patients I have seen there was a history of a direct blow on the patella, the fragments were widely separated, and operation showed the fascia torn. Two of my patients were riding together in their auto when it collided with a street car; each sustained a fractured patella caused by the knees being thrown against the instrument board of the auto. The driver's fracture was transverse, was comminuted, the fragments were widely separated, and the fascia torn. His wife's fracture was transverse, was compound, with fascia torn, and a separation of the fragments. Another patient was riding in an auto when it ran off an embankment, tipped over, and pinned him under the car. He had a compound comminuted fracture with separation of the fragments and torn fascia. Another patient jumped from the window on the second floor of a burning building. One knee had a long, deep cut into the joint; the other knee had a badly comminuted fracture of the patella with separation of the fragments and torn fascia. Of the seven cases I have had those having the greatest separation of the fascia were due to direct blows. These fractures caused by a direct blow were all comminuted; but they also had torn fascia and separation of the fragments. I believe many of these fractures are caused by a combination of both blow and muscle action, the powerful quadriceps muscle exerting a strong pull on the fascia at the same time the blow is received.

If the fascia and ligaments are not torn there is very little or no separation of the fragments. The amount of separation depends on the tear of the fascia or tendon of the quadriceps extensor, the bone being a sesamoid bone entirely enclosed in the tendon. Most cases I have seen were injured by a direct blow on the knee. In each there was separation of the fragments, and operation showed a torn fascia. Evidently the quadriceps muscle was under tension and exerted a pull on the patella at the time the blow was received.

Diagnosis. — Diagnosis is usually easy. The fracture is easily felt. There is immediate disability with loss of power of extension. The fragments can be readily palpated and are more or less separated in most cases—often widely separated. The knee becomes badly swollen very quickly. While the patient may be able to stand or even walk backwards, he suffers severe pain and his knee is very tender. *X*-ray will confirm the diagnosis, and show the extent of the fracture.

Prognosis.—A fractured patella is not dangerous to life unless it is compound and becomes infected. Bony union, however, is not as common as is often supposed, whether treated by open operation or not. Probably a large proportion of fractured patellas result in fibrous union regardless of the kind of treatment. But if the parts heal without too much separation, and especially if the fascia is not torn, or, if torn, has been united, the functional result should be excellent. Moorhead says, "Fibrous union is the rule; it may be so close, firm, and tough that in effect it is bony; but true caseous repair is rare." Speed says, "Fibrous union is the rule between bony fragments in most cases not treated by operation and probably in many operated cases, but in the latter instances this union is more stable and has better backing of the strong lateral ligaments, if approximation is performed with a complete understanding of pathology."

Treatment.—The immediate treatment is to immobilize the entire leg with a long posterior splint. If the fracture is compound, separate the skin opening and pour in all the iodine it will hold. Absolute rest in bed, elevation of the leg, and ice bags will help to relieve the pain, stop the bleeding in the joint cavity, and promote absorption of the swelling caused by excessive joint fluid and blood clots. While in some cases with but very little separation of the fragments and apparently no tear of the fascia, closed treatment may give fairly

good results, most fractures of the patella should be treated by open operation unless contraindicated by some constitutional disease, old age, or a very much weakened general condition. Practically every case that is comminuted or in which there is separation of the fragments has torn fascia lying between the fragments which will interfere with union. There is so much swelling that it is usually impossible to approximate the fragments for some time. Without suturing the fascia the result is a weak knee which is often wobbly. One must realize that operation necessitates entering the knee joint, which demands the strictest aseptic technic as well as experience in bone and joint surgery. An infection resulting from an error in technic will be serious and will most probably cause at least a stiff knee, and may result in death. If proper hospital facilities and careful surgeons are not present the case should be transported to a place where they can be obtained. Most of these cases do better by waiting five to ten days before operation and they can be easily moved on a cot or a stretcher. Various incisions are used—curved both up and down, angling, and straight vertical. I prefer the curved incision with convexity upwards, as this allows less pressure on the scar afterwards and gives better access for suture of the torn ligaments on each side of the patella. After opening the joint all blood clots should be gently wiped away, small particles of bone that are entirely loose or are too badly crushed to grow should be removed, and the fragments brought together. One or two deep sutures should be placed in the fascia on each side of the patella to bring the torn and separated edges of the fascia together; this will also bring the separated edges of the patella together. Then use a row of mattress sutures through the fascia and periosteum across the top or anterior surface of the patella, taking the bite a little ways back from the torn edge; follow this with a running stitch to bring the torn edges of the periosteum together, being sure that no torn edge or flap of fascia or periosteum drops down between the fragments. In badly comminuted fractures a suture encircling the entire bone may be necessary. When there is a good deal of tilting of either of the fragments, holes may be drilled in both upper and lower fragment starting one-quarter to one-half an inch from the edge of the fracture on the anterior surface and directed towards the posterior part of the fractured edge so as to come through on the fractured edge near but not quite to the posterior surface. Then catgut is threaded through these holes, tying the fragments together. All sutures should be absorbable. Very few surgeons use wire for this operation. The skin should be closed without drainage, and a long posterior splint applied, preferably a moulded plaster of Paris splint. Daily massage of the leg will help to keep the muscles in good condition; most authorities advise no motion for two to three weeks.

Results.—In three to six months a good functional result should be obtained. A few cases will have some weakness particularly in going up and down stairs, but this should improve with time. Refracture of the patella when it occurs is generally during the first year. E. M. Cornor of London says that the patella is more often refractured than any other bone. The disability period should average ten to sixteen weeks total and eight to twelve weeks partial disability.

Case 1.—Mr. M. A., aged 29, was injured September 4, 1904, by being thrown from a wagon in a run-away. He struck on the hard road, sustaining a simple fracture of the right patella with separation of the fragments. Operation was performed the next day. Blood clots were removed, holes were drilled, angling into the upper and lower fragments and threaded with catgut, bringing the fragments together. The skin was closed without a drain. Result was a good walking leg with good motion. I saw this man several years after his accident and his right leg seemed to be as good as his left.

Case 2.—Mr. D. R., aged 49, was injured December 12, 1912. He was struck on the head by a falling poker which rendered him unconscious. When he came to, he was unable to walk and had severe pain in his left knee. He had a simple fracture of the patella with a separation of the fragments, which was sutured with catgut. His knee is as strong as before the injury, and motion, while not good, is nearly as free as before, he having had very much limited motion, the result of an old septic knee.

Case 3.—Mr. A. S., aged 45, a merchant, was injured July 26, 1923. While driving his auto he collided with a street car and the impact of his knee against the instrument board of his car caused a transverse and comminuted, though not open fracture of the left patella. He was operated on July 28. Operation showed a fracture at the junction of lower and middle third, comminuted, the capsule being badly torn. The joint was full of blood clots, which were cleaned out. A deep catgut suture, placed in the fascia over the anterior surface of the patella, was imbricated, the distal edge, being shorter, was placed under the longer proximal edge and sutured with catgut, using mattress stitches as in a hernia operation, followed by a running stitch for the top layer. The result was perfect motion and no apparent weakness.

Case 4.—Mrs. A. S. (wife of Case No. 3), aged 42, was riding with her husband when he was hurt. She sustained a compound fracture of the left patella. Operation was

performed August 3, eight days after the accident. Inner side of fracture was not much separated, but outer side was separated more than one-half of an inch and the fascia on this side badly torn. A mattress stitch of No. 3 chromic catgut was placed in the fascia outside the patella; the covering of the bone was loose at the edges of the fracture. These edges were imbricated with mattress stitches, followed by a running stitch of catgut. Result—a fibrous union with some stretching of the tissue and some tilting of the lower fragment. She has, however, a good walking leg with good motion.

Comment.—Angling holes drilled through upper and lower fragments would probably have given a better result.

Case 5.—Mr. R. N., aged 22, was injured August 19, 1923. He was riding in an auto which tipped over, pinning him down in some water in a ditch, where he was held for about two hours. His injured knee was under water and he says he put his finger in the wound, trying to find out what the trouble was. When he was brought to the hospital, we found he had a compound fracture of his right patella, the opening being one inch long and the fracture comminuted. The wound was filled with iodine, worked into the joint as much as possible. No infection followed. Operation was on the twelfth day. The original wound was reopened and enlarged, extending across the knee. The middle piece of bone was entirely loose and was removed. The capsule attached to the upper fragment had a long overhanging edge between the fragments. Blood clots were removed, the fascia sutured on each side of the patella, as well as across the anterior surface, imbricating the torn edges across the anterior surface, and closing without drainage. Flexion to more than a right angle and a good working and walking leg was the result.

Case 6.—Mr. J. S., aged 52, was injured December 14, 1923, by slipping on some ice. He sustained a simple fracture of the left patella. Operation seven days later showed the outer part of the patellar fragments separated half an inch and the joint cavity full of blood clots. Capsule was not torn as badly as some of the others. His fascia was sutured similarly to the other cases and, like the others, healed without infection. He has good motion and a strong leg.

Case 7.—Mr. J. D., aged 40, was injured March 8, 1924. He jumped through the window on the second floor of a burning building just ahead of part of the falling wall and was knocked down by falling brick and debris. He had a deep cut into the right knee joint, a badly cut face, and a comminuted fracture of the left patella. The right knee and face were sutured immediately. Ten days later, the right knee being healed, his fractured left patella was sutured. The bone was broken into five pieces and one loose piece, one inch long by a half inch, was removed. The remaining fragments were brought together, deep sutures were passed through the fascia on each side, the covering over the patella sutured both vertically and transversely, and a posterior splint applied. The result was a very good, serviceable leg, with flexion to more than a right angle, and he is working every day at his old work in the planing mill.

MEMORIES OF THE SALPETRIERE*

C. Eugene Riggs, M.D.
St. Paul

My first view of the Salpêtrière, with the bronze statue of Pinel guarding its entrance, stirred in me varied emotions—pleasure at the gratification of a hope long deferred; a feeling of reverence because here the Great in Neurology wrought and achieved so worthily; satisfaction that I trod the ground where The Emancipator of the Insane, Philippe Pinel, struck off their manacles.

In 1793, Pinel, physician of the Bicêtre, went to those in authority in the Reign of Terror and demanded that he be permitted to break the shackles of those insane in the hospital. "Citizen," said one of those to whom he applied, "art thou insane thyself that thou will unchain such animals? I give them over to thee, but I am afraid thou will be the victim of thy presumption." Twenty-five years later, his pupil, Esquirol, thus describes the misery of these unfortunates: "They are treated worse than criminals and are reduced to a condition worse than that of animals. I have seen them naked, covered with rags, and having only straw to protect them against the cold and moisture and the hard stones they lie upon, deprived of air, of water to quench their thirst, of all the necessaries of life. I have seen them in narrow, filthy cells, fastened with chains, in dens in which one would not keep wild beasts." Pinel commenced to break their chains on the very day he was authorized to do so. In less than a week, he freed at the Bicêtre, fifty lunatics —some who had been in chains for ten, twenty and thirty years. Two years later, at the Salpêtrière, he carried out the same reform. For many years these two hospitals were the only ones where this barbarous system was not in force, and for a quarter of a century after Pinel broke the shackles so dramatically at the Bicêtre, his progressive ideas that everything should be done to alleviate the physical and mental sufferings of the insane, to treat them as patients—as human beings, not animals—to show them kindness and gentleness, advanced not one step. Pinel was fortunate; it was the fullness of time; he had a knowledge of insanity, and he was favored by circumstances. From those deplorable times to the non-restraint of today is a

*Read before the Minnesota Neurological Society, September 22nd, 1925.

long cry. Pinel, Pasteur, Charcot—a mighty triumvirate—Frenchmen Three!

In his autobiography, Mark Twain states that he had an excellent memory and that he remembered especially well the things that never happened. In these jottings, the occurrences actually happened.

Shortly after the death of Charcot, through the courtesy of his son, Jean Charcot, I had the opportunity of seeing French neurology at the close of its golden age. Although Raymond, Brissaud, Marie, Feré, Janet, Dejerine, Gilles De La Tourette, and other brilliant workers, were in the heyday of their usefulness and brought great renown to the French School, yet, after Charcot's death, Paris ceased to be the neurological mecca. Professor F. Raymond was genial, personally attractive, wonderfully equipped for his work. His pupils were devoted to him and his audiences cordial and appreciative. To me, Charcot's successor as a lecturer was particularly pleasing—his enthusiasm was inspiring and contagious; he carried one along with him on his current of thought, and there was a feeling of deep regret when the lecture was ended; but his brilliant efforts were in vain. French Neurology produced but one Charcot, and he was dead. Doctors and medical students passed Paris by, and Vienna became the medical mecca.

The Salpêtrière was then, and is now, justly famous—a marvelous reservoir of clinical neurology, inexhaustible and beyond compare. To the Salpêtrière and its distinguished staff, neurology will forever be a debtor. Notable among the cases I saw there was a patient suffering from tabes dorsalis, in whom the radius fractured as the pulse was being counted. While fragility of the bones in paretics and tabetics had long been a matter of anxiety to physicians, I had never seen an instance of such marked fragility. Before the discovery of Erlich, the care of paretics was a constant menace to one's mental equanimity, but since the use of the arsenicals in neurosyphilis, this danger of fracture has been, as far as my experience goes, eliminated. In another tabetic, Charcot twisted the arm around on itself several times. I was unable to understand this medical legerdemain until I observed that the head of the humerus had been entirely absorbed—an extreme illustration of the Charcot joint, which at this time was believed to be due entirely to lues. Now we know that it occurs in syringomyelia, compression and destruction of the spinal cord, severance of the nerves and disease of the peripheral nerves. Rare manifestations of this neuropathic arthropathy are the Charcot spine and involvement of the interphalangeal joints; the cervical and lumbar spine would seem to be the point of selection in the former. Arsphenamine, unfortunately, does not appear to have acted as a deterrent in these joint affections. Patronymics are to be deprecated, yet in these arthropathies, the designation Charcot has been happily applied.



Professor J. M. Charcot.

Another interesting case in this neurological curiosity shop was that of a man who, at two years of age, had an attack of infantile paralysis and thirty-two years later developed progressive muscular atrophy, while from childhood he had suffered from migraine. Charcot believed that poliomyelitis predisposed to progressive muscular atrophy. My experience has not confirmed this opinion. Late epidemics have shown us that poliomyelitis does not confine itself to the anterior horns, but may, to a greater or lesser degree, involve the entire cord. Byrom Bramwell showed us that in progressive muscular atrophy the morbid process is not con-

fined to the nerve cell but affects the cord substance, the neuroglia never escaping even in its mildest forms. Charcot, because of the intrepidity of his scientific spirit, called down on himself severe criticism; his investigations of hypnotism made him most unpopular with his medical confrères—so much so that he was dropped from the medical society, and his name was anathema. Later these same medical men asked the privilege of reinstating him. His contention with the Nancy School regarding hypnotism was very sharp, the latter asserting that every person could be hypnotized, while he maintained that only the hysterical could thus be influenced. Jean Charcot hypnotized a young woman and explained to the late Dr. Alexander Bruce, of Edinburgh, and myself, in detail, the theory and conclusions of The Salpêtrière School. Hysterical paralysis, he said, could be cured by hypnotism, but hysterical palsy would recur, and after a time hypnosis would be a matter of daily routine, as happened in the experience of a member of the staff. Crime, according to him, was never committed under its influence unless the person was a potential criminal. In the laboratory experiment, if the subject were given a paper dagger and told to stab a bystander, if the blow were struck immediately, he would fall to the ground in a hysterical convulsion. One brought up under the amenities and social proprieties never violates them when under hypnosis. He commanded this young woman to kiss me; she stood motionless, her face a flame of scarlet—evidently greatly embarrassed; her embarrassment was no greater than my consternation. The failure of the experiment, he said, illustrated that a regard for the social conventions was stronger than hypnotic influence. This young girl, he said, had been taught by his father and himself to illustrate the phenomena of hypnotism, and that while she had the greatest confidence in them, yet, even under hypnosis, she could not be made to do anything that violated her social or moral code. One woman, whom I had noticed walking around the hospital on her toes, he used as an illustration of the power of suggestion. She was a devout person and spent much time in the chapel, the walls of which were adorned with suitable pictures, among which was an angel about to take to flight; his wings were extended and he was standing on the tips of his toes. Archaic though this conception of hypnotism is in the light of our day, yet it is a passing phase of great interest in the evolution of our present viewpoint. The awe, the glamour, the superstitious fear, which formerly surrounded it, has long since passed. The new psychology postulates the conscious and the subconscious mind; it is to the activities of the latter that we look for the explanation of hypnosis. This later concept may be also a passing phase in the evolution of our final knowledge, since, in a recent lecture, Dr. Bolton tells us that "the myth of the unconscious mind" is an exacerbation of world hysteria. At the time of my visit, the Babinski sign had just been described by him. Dr. Charcot demonstrated it to me and said its significance had yet to be determined.

One of the most interesting lectures I heard at the Salpêtrière was on epilepsy, by Dr. Gilles De La Tourette. He was a consummate actor and he simulated in a most dramatic manner an epileptic attack. I could scarcely convince myself that it was only a depiction and not an actuality. While in Paris, I spent a memorable morning with Feré at the Bicêtre. He was very gracious; it was a clinic on epilepsy—profitable and interesting. Dr. Feré was a big man physically and mentally, and neurology owes him a great debt. He was using borax, and was very enthusiastic over this form of therapy. Borax would again seem to be coming into its own; its combination with bromides and luminal is perhaps the treatment par excellence for this disease.

On my way to the Bicêtre, I passed the Place de la Concorde, and there arose before me the creaking tumbrils, the maddened crowd, the awesome Guillotine and the knitting women that Dickens has immortalized in the days that were red. A most vivid memory is that of a Parisian cocher, a unique personality, devoted to absinthe, with bulbous nose, red face and bleary eyes. Usually I went to the Salpêtrierè by the Seine. On one occasion, when I drove, it was a memorable and never to be forgotten experience; his pour boire was moderate, but his driving was that of a Jehu; his whip was always in motion and suggested the morning of July the 4th; one was in imminent danger of killing or being killed.

It did not take long to discover that French, as I spoke it, was persona non grata; wise forethought had provided me with a letter of introduction from Noyes Brothers and Cutler to their Paris

representative. There was placed at my command a most agreeable young man, whose French was impeccable. We visited the French medical publishing houses and book stores. The desired literature was obtained, and I was fortunate in securing a complete set—dating from the first issue of the Nouvelle Iconographie De La Salpêtrière, a journal founded by Professor Charcot, dear to the hearts of all neurologists the world over. This journal has been one of the pleasures of my professional life. The significant fact about this experience was the conversation of this young Frenchman. Apparently, he had recently come from the annual military maneuvers. All true Frenchmen, he said, gladly accepted military service—a war with Germany was inevitable—only in this way could France be made secure and the indignities of 1870 be blotted out. Any moment, he said, a call to the colors might be made. More ardent patriotism one never sees. His only regret was that of Nathan Hale—that he had but one life to give to his country; and this was twenty-nine years ago.

One incident occurs to me. A Russian who had been bitten by a rabid wolf was brought to the Salpêtrierè for treatment. The patient had been terribly torn and badly mangled; serious infection developed; treatment was successful. At this time the name of Pasteur was on all lips. Although he died in 1895 and was buried with such honors as few men receive, a year prior to my reaching Paris, yet a room of the Pantheon still contained the wreaths that decked his bier. Before his day, nothing was known of the cause of virulent illnesses. Surgery and maternity were handicapped by a paralyzing fear. Forty years later, the work of Pasteur had revolutionized medicine. Microbes, a deadly menace, became, by his splendid genius, agents for the restoration of health and the preservation of life. Recently an election was held in France to determine who was the most distinguished Frenchman. By popular acclaim, the laurel wreath was given, not to Louis XIV or the War Lord of Corsica, but to Louis Pasteur, the son of a tanner, the world's greatest chemist.

Charcot was the Macaulay of French neurology; he was the outstanding neurological figure of his day; his writings were waited for impatiently and read with ever increasing eagerness. To us younger men, he was a beacon light—a dynamic urge. His Lecons Du Mardi, a La Salpêtrierè, were deservedly famous; their publication attained an unprecedented popularity. Charcot revealed to the medical world the inexhaustible storehouse of the Salpêtrière and immortalized both it and himself. His last years were shadowed by the jealousy and acrimonious criticism of distinguished confrères; he suffered from valvular heart disease; age crept apace, yet his dignity and serenity were unruffled and his alertness, mental vision and scientific ardor were undimmed. Thus, in his 68th year, died Professor J. M. Charcot—a fit closing of a great life, the glory of whose setting sun surpassed in splendor its noonday radiance.

Spleen and Red Bone Marrow.—The Council on Pharmacy and Chemistry published a preliminary report of recent work with a mixture of spleen and red bone marrow. At one time desiccated spleen and a preparation of red bone marrow were described in New and Non-official Remedies. Later they were omitted because clinical experience with them had been disappointing. Recently, C. D. Leake and his collaborators have studied the effects of spleen and red bone marrow given separately and in combination. From their studies, these investigators conclude that a combination of spleen and red bone marrow is much more efficient than either spleen or red bone marrow alone. They conclude also that the administration of such a mixture has a beneficial effect on simple anemia, but is without effect on pernicious anemia. While the results do not permit a definite judgment, the Council believes that they are sufficiently favorable to warrant a thorough investigation of the effects produced by this combination on cases of simple anemia. The Council reports that Lehn and Fink, Inc., market Spleen and Bone Marrow Desiccated of declared composition, and that the Wilson Laboratories market a preparation under the proprietary name "Spleen-marrow" stated to be an extract of spleen and red bone marrow, but the method of preparation of which is not disclosed. (Jour. A. M. A., Sept. 5, 1925, p. 744.)

Robinson's Pernicious Anemia Cure.—One W. A. Robinson of Sisseton, South Dakota, has been exploiting an alleged cure for pernicious anemia during the past three or four years. His statements regarding the cause and cure of pernicious anemia prove him to be utterly ignorant of medicine. Robinson charges thirty dollars for a treatment. From letters received from physicians it seemed that the main part of Robinson's "Cure" was coarse sand, and this is confirmed by the report of the A. M. A. Chemical Laboratory. A physician has reported the case of a patient suffering from pernicious anemia who had taken the Robinson treatment and who apparently died from hemorrhages caused by the sand which had been swallowed. (Jour. A. M. A., October 24, 1925, p. 1323.)

DISORDERS OF SPEECH*

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Minneapolis

Speech disorders may be classified from the descriptive standpoint as follows: (1) delayed speech, (2) oral inactivities, (3) letter substitution, and (4) stuttering, which includes stammering.

DELAYED SPEECH

The normal child begins to use voluntary speech when it is about fifteen months old. If speech is delayed a year beyond this time the child should be examined by a physician who is familiar with nervous diseases. The four common causes for delayed speech are: (a) lack of mental development, (b) lack of necessity for speech, (c) continued illness with extreme malnutrition during infancy, and (d) unhealthy emotional attitudes.

Lack of mental development.—The brain must be normal in order that the child develop speech. Sometimes the brain is injured through accident or disease, and speech does not develop. If the injury is discovered early and treatment is instituted, speech may be improved, but if the child is left untreated for several years after the injury, the chances for improving speech are very remote.

Lack of necessity for speech.—Speech is developed in response to definite needs. If the child has too much done for it, speech is delayed or the speech is a jargon which no one but the parents can understand. Such children may be made to talk by refusing to give them what they want until they make an attempt to ask for it.

Continued illness with extreme malnutrition during infancy.—Speech disorders caused by illness or malnutrition should be referred to the physician for treatment. Such cases are not common.

Unhealthy emotional attitudes.—We find children who are extremely negativistic and who refuse to talk, and develop a condition of mutism. Sometimes we find even young children with emotional attitudes that are similar to those which we find in older people, whom we call hysterical. Here, there is a definite emotional conflict which shows itself in a physical symptom, causing the child to refuse to speak. Such cases need careful study and training, and in nearly every such case the home conditions must be modified.

ORAL INACTIVITIES

These consist of a slurring or indistinctness of speech, which may be due to some organic disease of the speech organs, to some emotional conflict, or to some difficulty in the learning process. The learning process is often interfered with through unwise attempts on the part of the parents or teachers to give the child phonetics. Some of the cases of oral inactivity have suffered from malnutrition in early childhood. The treatment consists of re-education of the speech organs through corrective phonetics, care being taken that the child is not made speech-conscious or over-anxious. In nearly every case emotional re-education is also necessary, since there has been built up a series of little fears and feelings of insecurity because of the speech defect.

LETTER SUBSTITUTION

This is usually called lalling or lisping, and is a substitution of one sound for another—such as *th* for *s*, *w* for *r*, *tsh* for *tr*, and *t* for *k*. This defect is often said to be caused by some abnormality of the teeth or palatal arch. Our observations, however, have led us to believe that a minority of these cases are caused by organic abnormality. The majority are caused by emotional conflicts. Many of them are due to a retention of infantile phonetic habits, and many of them are due to a retention of infantile emotional habits. The treatment consists of two parts: (a) emotional re-education, and (b) phonetic re-education. Even in those cases that are the result of organic difficulties there will be certain fears and emotional reactions connected with the speech which must be eliminated before a cure can be effected. In treating this defect the teacher must do three things:

1. He must determine the position of the tongue (or speech organs) in the incorrectly made sound.
2. He must know the position of the tongue (or speech organs) in the correctly made sound.
3. He must be able to determine what over-reaction of the articulatory organs is likely to give the sound desired.

In working with the child there are three points to be noted, which may be roughly stated as follows: (a) unlearning of the wrong position of the articulatory organs, (b) learning the right position of the articulatory organs, and (c) practice until a correct habitual use of the right organs has been obtained. This will mean that the teacher must have a thorough knowledge of phonetics.

*From the Minneapolis Child Guidance Clinic.

*Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, April, 1925.

Straightening the teeth is rarely necessary. Removing the tonsils and widening the palatal arch is scarcely, if ever, necessary. In the treatment care must be taken not to make the child too speech-conscious. Very often the lisper may, through unwise training, begin to stutter.

STUTTERING, WHICH INCLUDES STAMMERING

Stuttering, under which we include stammering, may be described as a break in the rhythm of speech due to a blocking or inhibiting of the muscle co-ordinations. It must not be thought of as a disease but as a symptom of any of a number of underlying conditions.

Stuttering is common enough in children to constitute a very serious difficulty. In a personal survey of six thousand school children of Madison, Wisconsin, it was found that eight out of one thousand stuttered. Dr. Wallin found in a survey of St. Louis school children that seven out of one thousand stuttered. The average percentage of stuttering found in many surveys in this country and abroad shows that about nine children out of every thousand stutter.

Not infrequently we hear it claimed that children who stutter will overcome it in time. In order to determine the number of boys and girls who reach eighteen and still stutter, a personal survey was made of fourteen hundred members of the entering Freshman class at the University of Wisconsin. It was found that one per cent of the students had a marked stutter, and one per cent had a mild stutter, making two per cent in all. It will be seen from these figures that stuttering is not outgrown to any great degree, and even though the defect itself disappears there remains the defect in the emotions—an undue sensitiveness, a feeling of inferiority which interferes with the progress of the individual.

There is, apparently, very little relationship between the severity of the symptom and the severity of the emotional difficulty which is the cause of the symptom. Many people have a very slight defect, so slight that it cannot be noticed, but they feel severely handicapped because, as one boy expressed it to me, he never knew when he was going to have trouble with a word, and, even though he stuttered very rarely, meeting people and adjusting to groups were a terrible strain on him.

Curiously enough, the distribution of stuttering in boys and girls is very disproportionate. There is four to six times as much stuttering among boys as among girls. Just why this is so, no one knows. When a girl does stutter, however, it is just as difficult to overcome the defect as it is in a boy.

We do not find any explanation of the cause of stuttering through the examination of the bodily organs. Of course, such conditions as malnutrition, diseased tonsils, carious teeth, and nasal obstructions may cause an increase in the natural irritability of the nervous system, but those conditions are not the cause of stuttering.

Moreover, stuttering is not inherited. A sensitive nervous system is inherited, on the basis of which stuttering is likely to develop without the proper discipline and training.

Speech is man's chief medium of adjustment to other people; this is the great function of speech. Speech is the chief means by which we come in contact with our fellow beings. It is the way in which we adjust ourselves to the great group. Stuttering, then, is caused by the fear, partly conscious and partly subconscious, of meeting the group. The child fears to meet the group, but he also has a desire to do so. He would like to flee away from the situation altogether. He would like, if possible, to meet the situation. These tendencies to flee away and to meet the situation come into conflict, and we have a compromise in which we have neither good speech nor absence of speech, but broken, inhibited, stuttering speech.

A search of the emotional life of stuttering children always reveals some of these defects—timidity, strong feelings of inferiority, an over-dependence on the parents, and feelings of inadequacy. In some cases we notice a marked rigidity towards life, an unwillingness to change food and sleep habits, an over-suggestibility, a chronic fear of meeting certain groups of people or situations, and a marked sensitiveness.

The essential characteristic of the temperament of the stuttering child is a marked sensitiveness to social situations. This sensitiveness is really a great virtue if properly trained and controlled. In my own experience with stutterers, I have come to feel that they have the most pleasing and delightful personalities of any group of people that I know of. Their quick responses to social situations, their marked sensitiveness, their keenness of perception of social relationships give them an insight and develop in them a type of personality which is pleasing and appealing. Stuttering, then,

should not be thought of as something that is wholly bad. It should be thought of more as a danger signal which indicates that the child requires very careful training in order that he may make use of a sensitive, over-reacting nervous system.

The treatment of stuttering falls under three headings: (a) physical hygiene, (b) mental hygiene, by which we mean emotional re-education, and (c) relaxation and training in muscle co-ordination.

(a) The laws of physical hygiene are well known to parents, so we will not dwell on this phase.

(b) In mental hygiene the most fundamental thing is the changing of the general emotional reactions and the correcting of faulty attitudes which give rise to tension. The child must be trained to work successfully rather than to day-dream, and to get along well with other children. Some outlet must be found for the child's fundamental, social, and biological tendencies and for his necessity for winning some success.

As part of the re-education we include suggestion. This may be given in two ways: (1) Direct suggestion, by showing the child that he can talk when alone and in certain situations, and then assuring him that if he can talk in one situation he can talk in others. (2) Indirect suggestion is given by the teacher's attitude and by the attitude in the home. It often occurs that the indirect suggestion of the attitude in the home overcomes all of the teacher's good work with the child. Whenever the child does well, he should be praised for it and the suggestion given that he will be able to continue to improve until, finally, the speech defect is eliminated altogether. Gradually, as the child improves, he should be made to give talks in front of other people and to place himself in situations where he will have to talk and answer questions.

Parents should absolutely ignore the child's speech defect. They should not ask him to repeat the sentences and should not seem distressed or irritated when the child becomes blocked or inhibited. Even slight changes of expression on the face are noticed by the stuttering child. An example of this is a boy I once treated for a year without any results whatever. His parents moved away, and he remained in the city in order to go to school. During the year that he was away from his parents, his speech defect was completely eliminated. I asked him why he did not get well while he was at home. He said, "I used to feel so badly at home every time I stuttered because my mother would look distressed and unhappy, and this made me so self-conscious and nervous that I could not get well while I was at home."

(c) The use of phonetics or of vocal exercises, such as inflection, change of pitch, breathing, etc., is to be avoided. There is no difficulty in the child's speech mechanism. The difficulty is chiefly psychological. Practice in speech, as a whole, and talking to people are to be encouraged because this is really training the child to meet situations. One of the most helpful things is the teaching of general relaxation. In this the child lies down and relaxes the whole body—feet and legs, thighs, abdomen, chest, neck, fingers, forearm, upper arm, and, finally, the tongue, jaw, and face. When the child is completely relaxed he is asked to repeat a sentence, and, later on, to tell a story and to carry on a conversation; and when he can do this, he is trained to carry this feeling of relaxation with him as he goes about his daily activities.

THYROID PREPARATIONS

Reid Hunt has recently pointed out that dosage with thyroid is largely empiric. The labels on the commercial preparations are as a rule not very elucidating. Dosage expressed in terms of grains of fresh gland is about as rational as reference of the dosage of morphin to the fresh juice of the poppy. The iodin content of thyroid preparations has been made the basis for their pharmacologic evaluation, and the work of Hunt indicates that there is a close parallelism between the physiologic activity of thyroid preparations and their iodin content. So long as the laboratory workers can actually measure the comparative potency with considerable accuracy in relation to iodin content, physicians ought to be eager to grasp this easily determined index as a guide to therapy. There should no longer be justification for prescribing "thyroid tablets" indiscriminately, particularly when it is realized that one "tablet" may contain 2,500 times as much thyroid as another "tablet," the range which is shown to be possible. Very few of the thyroid preparations on the market comply with the U. S. Pharmacopeia Standard. If all physicians were to base the dosage in prescribing thyroid gland on the pharmacopeial product, known as "thyroideum siccum" and to assure themselves that the product which they prescribe contains a definite amount of dried thyroid gland, the present state of confusion would be relieved and thyroid therapy would be placed on a more rational basis.

(Jour. A. M. A., Sept. 26, 1925, p. 978.)



HERMAN M. JOHNSON, M.D.
Dawson
President of the Minnesota State Medical Association, 1926

MINNESOTA MEDICINE

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EDITORIAL

Medical Propaganda

The term propaganda acquired a certain unsavory flavor during the World War. This was due to its abuse in the spreading of false reports and may be charged to the war hysteria generally manifest. There is no reason, however, why propaganda should not be respectable in every way.

The national organization of the medical profession is carrying on some very valuable activities for the education of the public in medical matters. Hygeia, the lay medical magazine, is a good example. In our own state, addresses on medical topics are given over the radio by members of the profession in the name of the state medical association. The Minnesota Public Health Association is doing valuable educational work as a private institution supported by public contributions but under strict supervision of physicians. This is all professedly propaganda.

There are certain forms of propaganda which physicians are particularly qualified to undertake. They spend their energies in the study of disease in its relation to individual and public health. Other forms of propaganda for the avowed purpose of increasing practice or income should not be condoned.

Much attention has been given of late to the subject of periodical health examinations. Examinations of this sort are of proven value and should be encouraged. We do not believe, however, that it would be proper for the physician either individually or organized to institute any campaign among the laity to further the idea. Such activity would smack too much of commercialism. The idea of what constitutes a health examination might well be sold to the profession at large. Let lay organizations, if they so desire, carry on any propaganda along this line among the laity.

Recently a propaganda scheme has been circulated among members of the profession in the Twin Cities, the main theme of which is the encouragement of people to pay their doctors' bills. Now doctors' bills should be paid just as promptly and just as fully as any other bona fide obligations. Perhaps they are. If so, we are sorry for the merchants. It would seem that the budget of the average family does not allow for such contingencies as accident and sickness. It is notorious that most families live right up to their income and installments on the auto have to be paid before everything else. By the time the hospital is paid with what ready cash can be raised the doctor may consider himself lucky if his bill is paid on a time basis.

The proposal mentioned is said to have originated in Tulsa, Oklahoma. Local physicians were having difficulty in collecting their fees. Some newspaper publicity artists sign up a number of physicians who finance a series of newspaper articles with captions such as "Have you paid for your last baby yet?" The importance of paying the doctor's bill is the theme of each of some thirteen articles.

It is to the credit of both the Hennepin and Ramsey county medical societies that the proposal was overwhelmingly disapproved. Such propaganda by non-medical men is a two-edged sword and may, without very careful censorship, defeat its object.

The conscientious citizen might well take offense. The proposition is, to say the least, undignified and is of too commercial a nature. Ours is a profession and commercial methods in their entirety cannot be adopted. If we are in business let us

go the limit, refer cases on a commission basis and advertise. If our work is more than a mere earning of a livelihood, let us adhere to our self-imposed ethics and preserve our dignity.

Cardiovascular Disease

The differential diagnosis between primary kidney and primary heart disease is often difficult. The part that arterial change plays in the clinical picture often makes the diagnosis most complicated. The general use of blood chemistry determinations and functional renal tests has aided greatly in this differentiation. Notwithstanding such advance, terminal pathological changes in the kidney in many instances cannot be accurately predicted from clinical data.

In former days it was thought that glomerular destruction was the cause of vascular hypertension. The greater the glomerular destruction the higher the blood pressure, and hypertension over 190 systolic must of necessity be nephritic in origin. With the observance of individuals with blood pressure readings over 200 who lived for years without developing signs of nephritis, came the realization that our conception was incorrect.

With the development of pathology an effort was made to classify nephritis from the appearance of the kidney at autopsy. We were told that in acute nephritis the kidney was slightly large and red; in subacute nephritis, large and white; and in chronic nephritis, small, white and granular. Parenchymatous, tubular and interstitial were the terms applied, depending on the predominance of pathological change found.

Realizing the difficulty in correlating clinical and necropsy findings, purely clinical classifications have been proposed. Christian has divided nephritis into acute, subacute, chronic, with or without hypertension and edema. He also includes a subdivision of arteriosclerosis leading to nephritis.

Neither a purely pathological nor a purely clinical classification is satisfactory. The classification of nephritis as described by Volhard and Fahr has proven most satisfactory to many. Under nephrosis is included toxic degenerative kidney disease showing tubular degeneration, cloudy swelling and congestion of the glomeruli. Nephrosis is differentiated from the inflammatory nephritis, acute and chronic. Other subdivisions include the so-called benign sclerotic kidney showing sclerosis of the larger kidney vessels and the malignant sclerosis in which the large and small kidney vessels are sclerosed and glomerular and tubular changes are present.

We have come to realize that hyperpiesia or essential hypertension is a clinical entity the cause of which is not perfectly clear. The article by Dr. E. T. Bell of the University of Minnesota which appears in this number of MINNESOTA MEDICINE is most interesting. Carefully kept clinical and autopsy records form the basis for his views. His figures show that very high blood pressure cases are more likely to be hyperpiesia than nephritis. Nephritis accompanied by a blood pressure over 240 is rare, the usual range being from 150 to 200. The conception that nephritis is always glomerular with secondary changes in the tubules and secondary connective tissue replacement is confirmed by his studies.

Perhaps the most valuable clinical conclusion to be drawn from his work is the fact that only 5 to 10 per cent of essential hypertension patients die of renal insufficiency; the majority of such patients die of cardiac failure or cerebral accident.

While the majority of cases of hyperpiesia show arteriolar sclerosis of the kidney vessels it is a significant fact that all do not. It is easy to understand how the blood pressure must become elevated to maintain circulation when the elasticity of the arterioles is diminished and the lumen narrowed by the sclerotic process. This is simply a matter of physics where the peripheral resistance is increased. The cause of the elevation of pressure in the cases that do not show the arteriolar change still remains unexplained.

It is such correlation of clinical and pathological data that is going to clear up our conception of this clinical group known as cardiovascular disease and Dr. Bell has made a real contribution.

It has been asserted by responsible people in our part of the country that the places of physicians in rural districts are being filled by osteopaths and chiropractors and that the country people are being forced to depend on the irregular practitioner. I canvassed this three years ago by the postcard method, and concluded that the irregulars are mostly in cities. Recently I received the official list of chiropractors of the state. There are 376 located in the state at the present time and of these, 154, or 41 per cent, are in Minneapolis. To go to the other extreme, only thirty out of the total number are in towns of less than 1,000 inhabitants. — *Dean E. P. Lyon, Proc. Ann. Congress Med. Educ., etc.*

OBITUARY

DR. THOMAS ROY MARTIN

Dr. Thomas Roy Martin died after a very short illness, Sunday, November 15, 1925, at the age of forty-three years.

Thomas Roy Martin was born in southern Wisconsin in 1882. He was graduated from the University of Minnesota academic department in 1904 and received his degree from the medical department in 1907. Dr. Martin served an internship of eighteen months at the City and County Hospital, St. Paul, and until 1911 was an assistant in Pathology at the University of Minnesota under Professor Wesbrook.

Dr. Martin went to Duluth in 1911 to assume charge of the laboratory of the State Board of Health. In 1913 he entered the medical department of the Duluth Clinic, specializing in gastrointestinal diseases. He continued in that capacity until his death. In 1913 he married Miss Jessie Edgerton, who, with their three children, Thomas, Ruth and Frank, survives him. He is also survived by his father and mother, of Mantorville, Minn., and a sister, Mrs. Senn, of Waseca.

Dr. Martin was held in universal esteem. He had been president of the St. Louis County Medical Society and was a member of that body, the State Association and the American Medical Association at the time of his deatb. Quiet, unobtrusive, kindly, rational and extraordinarily judicious, he brought to his patients and his profession an impersonal eagerness that won him a large following. He is deeply mourned by all the profession in Duluth.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

SCOTT-CARVER MEDICAL SOCIETY

At the regular annual meeting of the Scott-Carver Medical Society, held Thursday, Dec. 3, 1925, at New Prague, the following officers were elected for the ensuing year: President, Dr. Fred H. Buck, Shakopee; vice president. Dr. H. A. Schneider, Jordan; secretary, Dr. H. W. Reiter, Shakopee; delegate to the State meeting, Dr. B. H. Simons, Chaska; alternate, Dr. M. B. Hebeisen, Carver.

A very full attendance was registered. The Society was entertained and banqueted by the New Prague Community Hospital Board, to whom, together with Dr. E. E. Novak and Dr. W. F. Maertz of New Prague, much credit is due for the success of the meeting.

Case reports on "Myeloid Aleukemia" and "Gonococcus Meningitis" were presented by Dr. M. B. Hebeisen.

Dr. John P. Schneider, Minneapolis, gave a talk on "The Classification of the Arthritides" and lantern illustrations of the more uncommon lesions of the stomach and esophagus.

STATE ASSOCIATION REDISTRICTED

At the last meeting of the Council the following plan of redistricting suggested by Dr. H. M. Workman was adopted, subject to ratification by the House of Delegates:

District No. 1

W. F. Braasch, M.D., Councilor

Counties — Dodge, Fillmore, Freeborn, Houston, Mower, Olmsted, Steele, Wabasha, Waseca, Winona.

District No. 2

L. Sogge, M.D., Councilor

Counties—Cottonwood, Faribault, Jackson, Martin, Murray, Nobles, Pipestone, Rock, Watonwan.

District No. 3

H. M. Workman, M.D., Councilor

Counties—Brown, Bigstone, Chippewa, Lac qui Parle, Lincoln, Lyon, Pope, Redwood, Stevens, Swift, Yellow Medicine.

District No. 4

F. A. Dodge, M.D., Councilor

Counties—Blue Earth, Carver, Le Sueur, McLeod, Nicollet, Renville, Scott, Sibley.

District No. 5

J. F. Savage, M.D., Councilor

Counties—Chisago, Anoka, Dakota, Goodhue, Isanti, Ramsey, Rice, Washington.

District No. 6

W. H. Condit, M.D., Councilor

Counties — Hennepin, Kandiyohi, Meeker, Sherburne, Stearns, Wright.

District No. 7

J. G. Millspaugh, M.D., Councilor

Counties—Beltrami, Benton, Cass, Clearwater, Crow Wing, Douglas, Hubbard, Mille Lacs, Morrison, Todd, Wadena.

District No. 8

G. S. Wattam, M.D., Councilor

Counties—Becker, Clay, Grant, Kittson, Lake of the Woods, Mahnomen, Marshall, Norman, Ottertail, Pennington, Polk, Red Lake, Roseau, Traverse, Wilkin.

District No. 9

W. A. Coventry, M.D., Councilor

Counties—Aitkin, Carlton, Cook, Itasca, Kanabec, Koochiching, Lake, Pine, St. Louis.

Dr. W. A. Coventry was appointed by the President as the Councilor for the new district.

NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

The annual meeting of the Nicollet-Le Sueur County Medical Association was held at Le Sueur December 8, 1925. Banquet at 6:30 P. M. The business meeting and program was held at the Farmers State Bank.

The following officers were elected for the coming year:

President—Dr. B. F. Smith, St. Peter State Hospital, St. Peter, Minn.

Vice President—Dr. H. B. Aitkins, Le Sueur, Minn.
Secretary—Dr. J. W. Daniels, St. Peter, Minn.
Treasurer—Dr. F. P. Strathern, St. Peter, Minn.
Censor—Dr. W. W. Covell, St. Peter, Minn.

The following were added to our membership:

Dr. Geo. H. Freeman, Superintendent St. Peter State Hospital, St. Peter, Minn.

Dr. J. A. McKean, Montgomery, Minn.

Dr. J. F. Norris, St. Peter State Hospital, St. Peter, Minn.

Dr. J. E. LeClerc gave a very interesting paper on "Head Injuries," followed by a very free discussion.

Dr. H. B. Aitkins gave a paper on "Morbidity in Childbirth."

Dr. Geo. H. Freeman, St. Peter, was elected delegate to the House of Delegates for the State Society meeting of 1926 with Dr. Swan Ericson of Le Sueur as his alternate.

It was decided to raise the allotment for the Gorgas Memorial Hospital.

AMERICAN BOARD OF OTOLARYNGOLOGY

The next examination of the American Board of Otolaryngology will be held in Dallas, Texas, on April 19, 1926. Applications may be secured from the Secretary, Dr. H. W. Loeb, 1402 South Grand Boulevard, St. Louis, Missouri.

OF GENERAL INTEREST

Dr. F. J. von Bohland of Belle Plaine is spending the winter in California.

Dr. W. James Marquis, formerly of the Mayo Clinic, is now located in Houston, Texas.

Dr. Hilding C. Anderson of Duluth is spending a year in study at Vienna.

Dr. and Mrs. C. Curry Bell of St. Paul are receiving congratulations on the birth of a daughter.

Dr. C. F. Wohlrabe, formerly associated with the Swedish Hospital, Minneapolis, is now practicing medicine in Young America, Minnesota.

Dr. Isaac Abt has been appointed attending physician in children's diseases at St. Luke's Hospital, St. Paul. Dr. Abt assumed his new duties January 1.

Dr. Edward V. Goltz and Dr. Alfred Hoff of St. Paul sailed this month for postgraduate study abroad. They will pursue their studies in Vienna and expect to return in the spring.

Dr. H. W. Grant of the Miller Clinic, St. Paul, is now in Gratz, Austria, where he is doing postgraduate work in diseases of the eye. Dr. Grant recently finished his three years' fellowship with the University of Minnesota.

Dr. W. L. Burnap of Fergus Falls, who recently suffered an injury to his leg as the result of an accident in which he was struck down by a taxicab, is recovering. The accident occurred in Cleveland, where Dr. Burnap was attending the annual meeting of the Radiological Society of North America. He has returned home and expects to resume his practice within a short time.

Dr. Harry P. Ritchie of St. Paul was re-elected secretary of the Western Surgical Association at the annual meeting held in Wichita, Kansas, December 18 and 19, 1925. Other officers of the Association are: President, Dr. Robert C. Coffey, Portland, Oregon; first vice president, Dr. Neil John Maclean, Winnipeg; second vice president, Dr. Vilray P. Blair, St. Louis; treasurer, Dr. Frank Teachenor, Kansas City.

At a reception held at the home of Dr. and Mrs. S. M. White, November 20, 1925, in honor of Dr. Berglund, the new chief of the department of medicine of the medical school, all the past chiefs of this department were present, Dr. Charles Lyman Greene of St. Paul, Dr. L. G. Rowntree of Rochester, as well as Dr. S. M. White, the retiring chief of the department.

The members of the department of medicine as well as of the Administrative Board were guests.

Mr. Frederick Hein, who has been associated with Noyes Brothers and Cutler of St. Paul for the past twenty-three years as manager of the Physicians and Hospital Supplies department, has resigned his position, effective January 1.

Mr. Hein first came from the East immediately following his graduation from college, intending to return East later to finish his medical course and practice medicine, but he was persuaded to accept the position which he has held since that time, thus changing from a professional to a business career. Mr. Hein expects to become established in business on his own account in the near future.

Plans are being made to run a Golf Special to the next meeting of the American Medical Association to be held in Dallas, Texas, in April, 1926. A Golf Special was run in connection with the San Francisco meeting in 1923 under the direct guidance of H. H. Gray of the Southern Pacific Lines, and proved such a success that the Golf Special is to be repeated this year.

The train will be limited to 125 people and those desiring to attend the meeting on this special must make reservations in advance. The train leaves Chicago, Sunday, April 11, at 6 P. M., and stops will be made at Nashville, Biloxi (Miss.), New Orleans, Galveston and San Antonio, arriving at Dallas, Saturday, April 17. The cost, which includes all expenses from Chicago to Dallas and return railroad ticket will be $215. Those interested should communicate with Dr. F. C. Warnshuis, Powers Theater Building, Grand Rapids, Michigan, at once.

CYRUS NORTHROP

Tribute is paid to Cyrus Northrop, president of the University of Minnesota for more than a quarter of a century, by Oscar W. Firkins, professor of comparative literature, in "Cyrus Northrop: A Memoir," which Mr. Firkins was commissioned to write by the board of regents. The book has just been published by the University of Minnesota press.

"Mr. Firkins," says the *Minneapolis Journal*, "has assembled and written a remarkable biography. In its frankness and minuteness it is true to the most modern standards. The little weaknesses and the boyish vanities are revealed quite unsparingly. The book mirrors the nature of Cyrus Northrop, the man."

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

ABBOTT LABORATORIES:

Arsphenamine-D.R.L., 0.3 gm. ampules
Arsphenamine-D.R.L., 0.5 gm. ampules
Neoarsphenamine-D.R.L., 0.15 gm. ampules
Neutral Acriflavine Jelly 1:1000-Abbott

ELI LILLY & COMPANY:

Para-Thor-Mone-Lilly
Para-Thor-Mone-Lilly P-20, 5 c.c.

MERRELL-SOULE COMPANY:

Powdered Whole Lactic Acid Milk-Merrell-Soule

PARKE, DAVIS & COMPANY:

Boro-Chloretone
Ovarian Residue Desiccated-P. D. & Co.
Capsules Ovarian Residue Desiccated-P. D. & Co., 5 grains
Tablets Ovarian Residue Desiccated-P. D. & Co., 5 grains
Ovarian Substance Desiccated-P. D. & Co.
Tablets Ovarian Substance Desiccated-P. D. & Co., 5 grains

SWAN-MYERS COMPANY:

Ampules Dextrose, 50 Per Cent., 20 c.c.-Swan-Myers

Arsphenamine-D.R.L., 0.3 Gm. Ampules.—Each ampule contains arsphenamine D.R.L. (New and Non-official Remedies, 1925, p. 47), 0.3 gm. The Abbott Laboratories, Chicago.

Arsphenamine-D.R.L. 0.5 Gm. Ampules.—Each ampule contains arsphenamine-D.R.L. (New and Non-official Remedies, 1925, p. 47), 0.5 gm. The Abbott Laboratories, Chicago.

Neoarsphenamine-D. R. L. 0.15 Gm. Ampules.—Each ampule contains neoarsphenamine-D.R.L. (New and Non-official Remedies, 1925, p. 49), 0.15 gm. The Abbott Laboratories, Chicago.

Scarlet Fever Streptococcus Antitoxin-Lederle (Refined and Concentrated).—A scarlet fever streptococcus antitoxin (Jour. A. M. A., May 2, 1925, p. 1338) prepared by immunizing horses by the subcutaneous injection of the toxic filtrate obtained by growing the scarlet fever streptococcus in broth; also by injecting cultures of the scarlet fever streptococcus. It is marketed in syringes containing 1 c.c. and in syringes containing 10 c.c. Lederle Antitoxin Laboratories, New York.

Saubermann Radium Emanation Activator, 100,000 Mache Units.—Each apparatus (New and Non-official Remedies, 1925, p. 315) imparts about 36 microcuries (100,000 Mache units) to about 500 c.c. of water daily. Radium Limited, U. S. A., New York. (Jour. A. M. A., Nov. 7, 1925, p. 1487.)

Para-Thor-Mone-Lilly.—Parathyroid Extract-Collip.—A stable, aqueous solution containing the active principle or principles of the parathyroid gland of cattle, having the properties of relieving the symptoms of parathyroid tetany and increasing the calcium content of blood serum. It is standardized by its capacity to increase the blood serum calcium in normal dogs one unit being defined as one one-hundredth of the amount of solution required to cause an increase of 0.005 gm. of calcium in the blood serum of a 20 kilogram dog. Para-Thor-Mone-Lilly relieves the tetany of parathyreodectomized dogs, and by its continued daily administration in small doses further attacks may be prevented. The product is a most potent therapeutic agent and its use may be attended with great danger unless due precautions are taken. It is claimed to be a specific in parathyreopriva and to have relieved acute and chronic tetany following thyroidectomy, so-called idiopathic tetany and infantile tetany. Para-Thor-Mone-Lilly is marketed in 5 c.c. ampules, each c.c. of solution containing 20 units. Eli Lilly & Co., Indianapolis. (Jour. A. M. A., Nov. 14, 1925, p. 1559.)

Neutral Acriflavine Jelly 1:1,000-Abbott.—Neutral Acriflavine-Abbott (New and Non-official Remedies, 1925, p. 134) 0.1 part, dissolved in karaya gum jelly, containing sufficient sodium hydroxide so that the finished product has a pH of from 8.3 to 8.5, to make 100 parts. Abbott Laboratories, Chicago. (Jour. A. M. A., Nov. 28, 1925, p. 1729.)

PROPAGANDA FOR REFORM

Lactic Acid Milk. — New and Non-official Remedies brings out that there is considerable evidence in favor of the therapeutic value of soured milk—particularly of sour milk containing an abundance of living *B. acidophilus.* Whereas the administration of *B. acidophilus* has for its object the implantation of living *B. acidophilus,* there are reports which indicate that the administration of milk sugar may produce the same results through promoting the growth of aciduric bacteria normally present in the intestinal flora. (Jour. A. M. A., Nov. 14, 1925, p. 1578.)

Side-lights on Intravenous Medication. — Intravenous injection involves difficulties of technic, with the possibility of local injuries to the peripheral blood vessels at the seat of operation. It presents dangers of bacterial contamination; the vehicle as well as the drug is immediately foreign to the blood, and other objections have presented themselves. The Council on Pharmacy and Chemistry has taken a decidedly conservative attitude toward the recognition of the scores of products intended for direct intravenous use. The wisdom of this stand has been attested anew by a recent report of Hanzlik and his collaborators, who report that a large variety of substances cause definite and important changes in arterial blood of test animals, accompanied as a rule by disturbances in physiologic functions. (Jour. A. M. A., Nov. 21, 1925, p. 1645.)

Herradora Products and Intravenous Therapy.—In 1923, the Council on Pharmacy and Chemistry found the intravenous preparations of the Scientific Chemical Co. (Marcus Aurelio Herradora, president) not acceptable for New and Non-official Remedies because of unwarranted and unsubstantiated statements in favor of intravenous and intramuscular administration of drugs and because of the complex and indefinite mixtures as represented by these specialties. From an examination of advertising recently received there appears to be every reason to reiterate the Council's conclusion that "the propaganda contained in the advertising matter issued by the Scientific Chemical Company is detrimental to the rational practice of medicine and to the public health." (Jour. A. M. A., Nov. 21, 1925, p. 1660.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of Oct. 21, 1925

The Minnesota Academy of Medicine held its regular monthly meeting at the Town and Country Club on Wednesday evening, Oct. 21, the meeting having been postponed one week on account of the Interstate Post-graduate Assembly meeting, Oct. 12-16. 1925.

The meeting was called to order by the President, Dr. H. L. Ulrich. There were 31 members and 2 visitors present.

The minutes of the September meeting were read and approved.

The following case reports were given:

1. Dr. A. W. Abbott (Minneapolis) showed an apparatus for holding a drainage tube in any cavity.

2. Dr. E. M. Hammes (St. Paul) reported two cases as follows:

(a) Female, age 30, married, seen in consultation with Dr. J. C. Ferguson, October 13, 1925.

The family and personal history were negative. The family stated that she had been perfectly well. She left her home on October 12, at 8 P. M., to take part in a musicale and to visit a friend. At quarter to one that night the doorbell rang three times. When they opened the door they found the patient lying in front of the door apparently semi-conscious, bleeding from the nose, with a little blood on her stocking and on the porch floor. The family thought she had been struck by an automobile and placed on the porch. However, there was no sand or dirt in her hair or on her clothes, and no evidence of violence or external injury.

Dr. Ferguson saw her at 10 o'clock that morning, when her temperature was 102, pulse 100. The patient was semiconscious and her neck was slightly rigid. I was asked to see her about 8 P. M. that evening. The patient was semiconscious, resistive, and gave one the impression of a catatonic dementia precox. When her arm was lifted she would hold it in that position and gradually drop it. When an attempt was made to open her eyes she would hold them tight. She was definitely resistive. Her neck was rigid. She had a questionable Kernig. All reflexes were normal. There was no evidence of any bruise on the head or on the body. She continually rubbed her forehead with her hand as if she had a severe headache. Her temperature at this time was 102.5, pulse 100, respiration 25, and her general condition was fair.

A lumbar puncture was done and about 35 c.c. of spinal fluid was removed, which was almost pure blood. Following the spinal drainage there was no special change in her condition. At 10 P. M. she died quite suddenly.

Permission was given for a post-mortem of the head only. Between the scalp and the occipital bone was a small diffuse hematoma about 2 inches wide and 4 inches long. On opening the skull there was a diffuse hemorrhagic exudate extending over both hemispheres, with a small blood clot under the left frontal lobe and a large blood clot about the size of a small egg under the right frontal lobe. The convolutions of both frontal lobes were quite macerated. The skull showed a fracture in the occipital region extending about 3 inches on the right side from the saggital suture longitudinally through the occipital bone. On the left side the fracture line extended from the saggital-lambdoid junction through the occipital bone into the foramen magnum. There were several short radiating fracture lines besides, beginning in the same area.

This patient evidently rang her doorbell, fell, and the impact from the fall on the wooden floor was sufficiently marked to produce the occipital skull fracture with the marked contra-coup hemorrhage of both frontal lobes. The hemorrhage evidently was secondary to the fall and not primary, because its location and distribution were such as one would expect in a contra-coup lesion in relation to a blow in the occipital region.

(b) The second case was a male, age 42, seen in consultation with Dr. A. R. Comstock.

The family history was negative except that his mother died of gastric carcinoma. The present history was negative. The present illness began during the last week in June, 1925, with intermittent pains and headache in the left frontal and occipital regions. This pain gradually became constant and increased in severity. About July 15 a diagnosis of sinus infection was made, and the left middle turbinate bone was removed. This gave no relief. By July 30 his left frontal headache was so marked that he had to discontinue work. The following day he was confined to bed. During that week he vomited twice. On July 27 he was examined by Dr. Morrison and Dr. Ahrens of the Nicollet Clinic. All findings were negative except for a definite choked disc, more marked in the left fundus, loss of right abdominal reflexes, and a moderate increased right knee jerk. The spinal fluid was under increased pressure, but normal otherwise.

Because of the choked disc, Dr. Strachauer performed a decompression operation over the left fronto-parietal region. The intracranial pressure was found greatly increased, but no tumor or abscess could be located. The headache subsided and the patient seemed brighter. With the formation of a hernia cerebri a right hemiplegia with aphasia developed.

I first saw him on August 28, 1925, at St. Joseph's Hospital, St. Paul. He had a marked hernia cerebri at the site of the decompression operation. He had no headache and seemed bright mentally. He presented a right hemiplegia with the usual pathologic reflex changes. He was aphasic. On September 5, about 5 P. M., he developed a generalized convulsion. A lumbar puncture was performed and 40 c.c. of clear, normal spinal fluid under increased pressure was removed. The convulsions continued, the patient became comatose and died within 36 hours.

A post-mortem was negative throughout except for a tumor of the left frontal region immediately under the operative field. This was subcortical, about the size of a large walnut, and was found to be a glioma. The foramen of Magendi was patulous and the ventricles were not distended.

The interesting points in this case are the fairly acute onset, the rapid progress, the marked intracranial pressure

with choked discs, which is quite uncommon in frontal brain tumors. The obscure symptoms emphasize the difficulty of a proper cerebral localization in tumors of this region.

DISCUSSION

Dr. A. Schwyzer: Isn't it possible that some of the bleeding had occurred before this patient fell? When I saw the blood spread over the brain surface and no damage to the brain substance and no cause for the fall was known, I was reminded of two cases of spontaneous hemorrhage I happened to come across, which were very interesting. The first case, a young man, 18 or 19 years old, was asked by two friends to go in an automobile, and the three young fellows raced around the country. When he came home he had a terrific headache and suffered from severe dizziness. There was perhaps a trace of rigidity in the neck. We took him to the hospital and did a spinal puncture. A raspberry-colored fluid came out under markedly increased pressure. The patient recovered.

The other case was similar. A lady about 55 years gave some orders to her chauffeur, who answered in an impertinent way. The lady is of quick temperament and became very angry. She suddenly became dizzy and had to be carried to bed, and a terrific headache came on. There was no fever in her case either. I took her to the hospital and made a spinal puncture. The spinal fluid was raspberry-colored and under increased pressure. Subarachnoid bleeding had occurred. Again, as in the other case, spinal puncture relieved the headache promptly and the patient recovered readily.

There was no later trouble in either of these cases.

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3. Dr. Arnold Schwyzer (St. Paul) reported a case of branchiogenetic cyst and showed *x*-ray plates.

History: When the girl, who is now 13 years old, was born, a walnut-sized soft and painless swelling was noticed low down on the right side of the neck. It gradually grew to the size of a goose egg.

In April, 1924, when the skin over it became thin and bluish, it was opened by the family doctor, who mentioned that the contents were a pus-like fluid. From the beginning a large pulsating vessel was noticed along the median side of this mass.

Since the cyst was opened it has drained a watery and partly purulent liquid constantly. There is no pain. The swelling inward and downward from the fistulous opening persisted. It is somewhat emptied, especially on pressure, and then fills out again.

Physical findings: Soft prominence to the outer side of the tortuous, very visibly pulsating large artery, which is the common carotid and runs near the midline at the level of the larynx to recede laterally again along the upper border of the swelling, which is soft and fluctuating. An irregular scar and tiny fistulous opening exists at the upper outer edge of this fluctuating mass. This pus can be expressed.

Remainder of the examination negative. A stereoscopic roentgenogram, after moderately filling the sac with bismuth paste, shows it to reach about an inch below the lower border of the head of the clavicle. The inner two-thirds of the clavicle itself are bulged out over the mass and join somewhat at an angle with the outer third. This by itself proves the early appearance and considerable size of the cyst.

Operation on October 5, 1925, allowed us to peel the sac out of the depth without much difficulty, while at the site of the fistula it was intimately grown to a large vein. The size of the sac was that of a large hen's egg.

Microscopically the lining of the sac was a pavement cell epithelium of from 15 to 20 cells thickness. The outer layers have a tendency to keratinization. The stroma underneath shows a shallow layer of dense round cells perhaps due to the suppuration; and underneath this layer we see unstriated muscle. The cyst is thus branchiogenetic.

Whether or not the cervical sinus itself could not form cysts is a matter of speculation. The marked downward growth of the third branchial arch causes overlapping over the fourth and causes the cervical sinuses laterally. From the third gill cleft the lower parathyroids originate and also the thymus. Kürsteiner under Langhans made serial sections of this area of the necks of newborn children and found that the thymus is liable to lose some of its tissue in its downward growth, leaving, besides the thymus cord, small heaps of the thymus tissue, at times forming little cysts. However, nothing is known that such cysts should become of macroscopic or even surgical importance. The branchiogenetic cysts come practically always from the second cleft.

The patient left the hospital a week after the operation with the wound apparently well healed.

DISCUSSION

Dr. Mann: This is an extremely interesting case and reminds us of others which we have seen and some of which we have operated. The last statement of the doctor, that because it was lined with thin or flat epithelium it could not be one of the cysts in connection with the thymus, is, of course, true. The contents of a cyst is more fluid and mucoid when it arises from the inner portion of the branchial clefts and the lining of the cysts is more like mucous membrane with flattish or sometimes cuboidal mucous cells. In rare cases they may be more columnar in type. When they arise from the outer portions of the cleft, nearer the skin, they are lined with flattened cells more of the squamous type, and then the contents show more and more sebaceous material as it approaches the outer or skin ending of the cleft.

The embryonic remnants of the branchial clefts fairly often persist as cord-like or tube-like remnants. When they persist throughout we have a fistula leading from the esophagus high in the neck to its exit much lower in the neck, due to the great downward growth of the external portions of the branchial arches.

When portions of the tubular remnants remain imbedded in the neck, they form cysts whenever the activity of their lining cells produces secretions sufficient to distend their lumens. These clefts are always interesting. The neck portion has grown down a good deal faster than the inner portion so that they slant from the outside upwards and inwards and go a good deal higher than we would expect. The drum of the ear closes the first cleft. No cyst, so far

as I know, has been reported in the first cleft. Most of these arise from the second or third. The only way to distinguish them after you find them is to see whether the line of the small tube-like projection which goes up to the esophagus, when it runs that far, goes above or below the styloid process and the stylohyoid ligament. In dissecting them out, we never know, until we go high into the neck, whether it is from the second or the third. It has to be followed up to that point before it can be distinguished.

I think the Doctor's method was very ingenious; to turn in the stump and thrust it through into the esophagus at a new point, seems to me a very admirable way of doing when the inner portion is cordlike and cannot be treated in the standard method, which is to turn the stump inside out by putting it through its own lumen into the esophagus.

Dr. C. Eugene Riggs (St. Paul) gave the paper of the evening, entitled "The Dynamics of Personality."

DISCUSSION

Dr. Christison: I believe it would be hardly fair to let that masterly production go without comment. As an address on sociology, I have never heard anything to compare with it. It affects me particularly and peculiarly. I have been connected with social service work in St. Paul for a good many years. One of the subdivisions of our United Charities is a children's bureau, wherein we deal with delinquent as well as with normal children. The things that Dr. Riggs has told us are going to help me a very great deal in that work. I think he understands the psychology of childhood better than any one I have ever known.

Dr. Riggs, I want to thank you personally for that paper.

Dr. A. Schwyzer: I arose from the same impulse that Dr. Christison did: that is, to express our thanks for this splendid address. That is not an ordinary paper. That is an address to read over in our families and there is in it a good deal of matter that is good not only for doctors but for the members of their families and for laymen.

One great hope remains in what the Doctor told us, that most of these defects are not really hereditary but are really accidental happenings under peculiarly unfortunate circumstances and are individual conditions that are not propagated.

There is so much wholesome philosophy in this study that I think I speak in harmony with everybody present if I thank the Doctor heartily for what he gave us tonight.

Dr. H. L. Ulrich: Dr. Riggs raised the question of nature and nurture, which has been a subject for discussion ever since there have been biologists. For two years I have observed children going through the Child Guidance Clinic in Minneapolis. My work was to study the endocrinopathics in which we attempted to show that endocrine disturbance may have some bearing on behavior. We have not been able to demonstrate a single case in which the endocrines are factors in the misconduct of the children. In practically all cases one could say it was nurture rather than nature.

The meeting adjourned.

John E. Hynes, M.D.,
Secretary.

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

STAPHYLOCOCCUS ENDOCARDITIS*

REPORT OF CASE

Victor K. Funk, M.D.
St. Paul

Mr. A. G., a German American, aged 56, was admitted to the hospital on May 25, 1925, complaining of: (1) shortness of breath; (2) pain over the precordium; (3) pain in the epigastrium; (4) dizziness; (5) neuritis.

Present Illness.—In September, 1924, the patient developed what he calls neuritis, which was manifested as a dull, nagging pain in his back, shoulders and neck. He was told at this time by his physician that his heart was normal. The pains moved from one part of the body to another, and obliged him to stop work. He saw several physicians, but obtained no relief from his pain. He then took a course of mud-baths, and at that time was told by a physician that he had leakage of the heart, but it was giving him no symptoms. In February, 1925, the patient had a severe attack of pain in the epigastrium which lasted three days. The pain was knife-like in character, and doubled him up. Two months prior to admission (March, 1925), while walking up a hill, he became very dizzy and had black spots before his eyes. He went to bed, but felt all right the next day, and remained well for one month. Then, one month prior to admission, he did some heavy lifting and following this became very short of breath. Since that time he has always been short of breath and has had a dull pain over the precordium. He frequently has had to sit up in a chair at night to get his breath and there has been some swelling of his feet and ankles.

Habits.—He has used tobacco to excess, but liquor moderately.

Past history.—He has had the usual diseases of childhood, but not scarlet fever, diphtheria, or rheumatic fever. Had never had any serious illness.

Physical examination.—The patient is well developed and well nourished, but very dyspneic, and has to sit propped up in bed. His lips and ears are very cyanotic. His tongue is coated and dry, and his breath has a bad foul odor.

Heart: Apex beat is visible as a wave in the fifth left intercostal space just outside of the nipple line. A systolic thrill is palpable over the whole precordium. On percussion the borders are 2 cm. to the right and 13 cm. to the left in the fourth intercostal spaces. On auscultation the heart sounds are entirely obliterated by a loud, blowing, systolic murmur, which corresponds in time with the radial

*From the service of Dr. J. S. Gilfillan, The Miller Hospital, St. Paul.

pulse. This murmur can be heard over the whole chest, but is loudest at the apex.

Abdomen: There is a slight tenderness in the upper right quadrant. Liver margin is palpable three fingers below the costal margin.

Extremities: No edema present.

Reflexes and sensation normal.

Blood pressure 100/70.

Laboratory findings.—Urine negative on two examinations.

Blood (June 22, 1925): Hgb., 65 per cent; r.b.c., 3,880,000; w.b.c., 12,900; p.m.n., 80 per cent; lymph, 20 per cent; r.b.c., normal.

Blood culture taken on June 22. 1925. showed 4 days later a luxuriant growth of staphylococcus aureus. The second blood culture, taken on June 26, 1925, again showed a staphylococcus aureus.

Clinical course.—The patient's daily temperature varied from 97 to 103.2 degrees. On a few days only his temperature did not rise above 99. The pulse rate ranged from 50 to 130, usually about 90, and was occasionally intermittent. He was at times irrational. On June 12, 1925, a red, painful nodule appeared on the tip of the left little finger. His breathing at times was very labored, and on July 9, 1925, he developed Cheyne-Stokes respirations. On July 17, 1925, he suddenly fell back in bed, and began frothing at the mouth as his respiratory passages filled with mucus. He remained in a comatose state for eight days and died on July 24, 1925.

Autopsy Report.—(Dr. Margaret Warwick.)

External appearance: One bright red area 2 cm. in diameter on left internal malleolus, and a similar smaller one 1 cm. in diameter on base of left toe.

Peritoneal cavity: No fluid, no adhesions; appendix retrocecal, bound down by adhesions.

Pleural cavities: No fluid. Firm fibrous adhesions over posterior surface on left.

Pericardial cavity: 25 c.c. of cloudy fluid in which were floating several large flakes of fibrin. Masses of fibrin are also found tightly adherent to wall of left ventricle.

Heart: Weight 430 g. The epicardium appears to be slightly opaque. Tightly adherent to it, and over the left ventricle are large flakes of fibrin which can be peeled off, leaving a smooth surface. The wall of the left ventricle is thickened to a moderate degree. The cavity of the left ventricle is moderately dilated. The aortic, tricuspid and pulmonary valves are all normal in appearance, but the mitral valve shows vegetations on two leaflets. One of these vegetations is a small compact mass on the leaflet just above the edge of the valve. Another is a very loose mass attached to the extreme edge of the leaflet and having with it a mass of clotted blood. Yet another small mass is attached at about the middle of the left auricular wall. All of these vegetations consist of very small masses of white, firm tissue, but with no evidence of ulceration. The heart muscle is rather soft in consistency and yellowish in color. At about the middle of the left ventricle is a white area about 1 cm. in diameter and evidently representing a fibrosed area. The coronaries show a very few slightly raised yellowish plaques which do not cause any appreciable narrowing or obstruction. The root of the aorta shows a very few slightly raised yellow patches.

Lungs: Left—dark red, crepitates throughout, showing on section a patchy red surface from which on pressure numerous droplets of pus exude. Right—solid and gray in color, showing on section grayish red consolidation with much pus escaping on pressure.

Spleen: Normal.

Liver: Cut surface shows a yellowish color with prominent tiny red mottlings, which stand out in sharp contrast.

Gall bladder, gastrointestinal tract and pancreas normal.

Adrenals: Soft centers.

Kidneys: Left, 160 g.; right, 140 g. Cortices thinned.

Bladder: Moderate amount of pus in contained urine. Mucosa red. No hypertrophy of prostate.

Head and neck not examined.

Cultures of heart's blood show a staphylococcus identical with that found before death.

Pathological diagnosis: (1) Staphylococcus bacteriemia; (2) acute vegetative endocarditis (mitral); (3) lobar pneumonia (right); (4) broncho-pneumonia (left); (5) acue fibrinous pericarditis; (6) acute cystitis; (7) healed pleuritis; (8) healed perisplenitis; (9) healed perihepatitis; (10) mild generalized arteriosclerosis; (11) fibrosis of heart veins.

Microscopic sections: Kidneys, adrenals, heart muscle, pancreas, all normal.

Lungs: Show the alveoli to be filled with pus cells in some areas; in other areas the alveoli are filled with desquamated endothelial cells, and some are filled with brown pigment (lobar pneumonia).

Bladder: Shows a much thickened wall in which is much new formed connective tissue with a very rich infiltration with lymphocytes and pus cells.

Liver: Shows the cords around the central veins to be thin and atrophic and to contain a large amount of brown pigment.

Prostate: Is atrophic and shows a very large amount of connective tissue.

Bronchial Node (left): Shows a loss of germinal centers and a rich infiltration with pus cells. There is also a large amount of brown pigment throughout.

A THALAMIC TUMOR DIAGNOSED HYSTERIA

George N. Ruhberg, M.D.
St. Paul

G. C., a man, 43 years of age, while feeding boards to a circular saw on June 3, 1924, was slightly injured. These boards were sixteen inches long and of equal thickness. The board that broke was not planed on one side, showing it was thinner than usual. The fingers of both hands were slightly scratched. He stated that he was a little disturbed over this accident, although it had happened before on numerous occasions. He resumed work and had worked a half hour or so, when he noticed another thin board. He did not feed it to the machine, but as he touched it, a queer sensation came over him. He felt dizzy and faint, and as if he had no left side to his body.

He slumped to the floor, and after a few moments tried to move his leg, but did not know where it was. His hand, while capable of slow motion, had no feeling. He soon became completely paralyzed over the entire left side of the body.

Examination in hospital by Dr. E. O. Giere showed his reflexes to be practically undisturbed, but he was unable to move the left side of his body, and he could not feel touch or pain over the entire area affected. On the second or third day he had regained partial use of the leg and arm, but the facial condition was replaced by pain and spastic movement, in which the left side could not be kept still, the arm moving in an irregular manner, so that taking an *x*-ray was impossible.

We were called in consultation, June, 1924, by Dr. Giere. The patient was abed and apparently deaf in the left ear. After a few moments of loud conversation, the voice was intentionally lowered and he understood perfectly. He complained that the sight of the left eye was not as good as that of the right, and tests revealed a narrowing of the field of vision in that eye. The facial muscles were normal in all movements, but he did not seem able to pucker his mouth to whistle. The tongue protruded straight. The grasp of the right hand was normal, but that of the left was diminished about one-half. There was no tremor. On walking, he dragged the left leg, but was able to support his weight on it. The reflexes were practically normal except the right plantar reflex, which was exaggerated and the left one absent. His Wassermann was reported positive at the hospital. He could not feel touch or pin-prick over the entire left side, including the face. The diagnosis made at this time was hysteria.

We saw him again on August 18th, when he came under our care. He walked with a limp of the left leg, and he had about a fifty per cent diminution of the strength of the left hand. He could, with difficulty, cross the left leg over the right. When he stood with his feet together he swayed to the left. The knee-jerks were somewhat increased, but no Babinski was present. The sensation to pain was absent over the entire left side. With regard to his hand, he could slowly perform all fine finger movements, but in a clumsy manner, and not with the same facility as with the right hand. His eye grounds were normal, and no diminution in the field of vision was present. Under treatment his anesthesia seemed to vary, in that points where he was insensitive, he could feel perfectly. The sensory tests varied so much at different times that it was difficult to definitely form an opinion as to their reality.

He passed from our care at this time to that of another neurologist in St. Paul, who concurred with our diagnosis. After this he was seen by other neurologists, both on his behalf and also for the insurance company, and also was seen by numerous other doctors, who were not neurologists. The diagnosis of traumatic hysteria was made by practically every doctor who saw him.

His condition became gradually worse, until June, when he was admitted to my service at the Ancker hospital. At this time his pupils did not react to light or accommodation. His left pupil was larger than the right. He had weakness of the left extremities. Reflexes on the left were hyperactive. A positive Babinski on the left and ankle clonus were present. He had incontinence of the bladder, and his mental state was stuporous, so that it was impossible to carry out a good test of superficial sensation. His blood Wassermann and spinal fluid tests were negative. The mistake in diagnosis, of course, was here apparent, as many signs of a central organic involvement were present. He died suddenly after admittance, and a post-mortem was performed by Dr. Noble. A hemorrhagic glioma, involving the right thalamic area and causing pressure on the internal capsule, was present. It was not encapsulated, was red and hemorrhagic in appearance, and soft and friable in consistency.

Two factors are present which can account for the common error in diagnosis. The first was that the case was a chronic one, extending over months in duration, during which time he never was under the observation of one man for over a short time. The other was the history of sudden onset, coincidental with the accident. The history given by us is as the man told it at the time of the first examination. Perusal of the court records shows that he gave a slightly different history on the stand, in that he stated he was neither surprised nor frightened at the time of the accident. By tracing the man from one doctor to another, and combining their observations, we find that this man at one time or another presented the following: hemichorea, hemiataxia, hemitremor, hemiathetosis, hemianesthesia, hemianopsia, and an exaggerated reaction to pain, involving chiefly the left shoulder. It was a typical thalamic syndrome. One neurologist was of the opinion that the man suffered from hysteria at first, which later merged into that of the organic syndrome. Our opinion was that he had the tumor before the accident, and that, due to its hemorrhagic nature, a sudden hemorrhage, sufficient to cause symptoms in this area, occurred coincidental with the accident.

The symptoms coming on abruptly at the same time as the accident, has made this case not only interesting as a diagnostic problem but also from a medico-legal aspect. It presents an example of a brain tumor which was repeatedly diagnosed traumatic hysteria by several qualified neurologists, as well as numerous general practitioners, and for that reason is reported.

But most important to us, is the security against smallpox existing in the state in which we live. This security depends upon the degree to which vaccination is practiced, and this in turn depends upon the enlightenment of its people and the existence and enforcement of vaccination laws. Some states which report such a large number of smallpox cases and deaths are among those which are most afflicted by the organized activities of the anti-vaccinationists. For example, vaccination is unpopular in Minnesota. The propaganda of the anti-vaccinationists has been successful since 1903 in keeping any laws requiring rigid statewide vaccination off the statute books, nor can vaccination be enforced in times of epidemics. The result is what one might expect. With a record of rarely less than 1,200 reported cases, and over 9,000 reported cases in 1921, Minnesota furnishes a striking example of what a state's smallpox history may be when vaccination is refused by its people.—*Am. Assn. for Medical Progress.*

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:
F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH
THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

DISEASE OF THE CORONARY ARTERIES: M. H. Nathanson (Abstract from the Am. Journ. of the Med. Sciences, August, 1925). Nathanson reports that out of 849 autopsies in 1923, from the Department of Pathology, the University of Minnesota, there were 28 deaths attributed to coronary sclerosis. Of these, 27 were above the age of forty. In this same group there were 70 cases of malignancy of various types, indicating the relative frequency of coronary sclerosis. On the other hand, 12 of the coronary cases were from the coroner's service, which would tend to exaggerate the frequency to a certain degree.

The author gives credit to Herrick for the newer conception of coronary disease and the various types of its clinical course. The author has endeavored to describe a clinical picture based on the material for study from the Department of Pathology, University of Minnesota, and comprises records of 113 cases. All these included severe coronary disease with narrowing and obliteration of one or more large vessels and fibrosis or softening of the heart muscle. No case was selected in which coronary disease was not considered the chief cause of death.

The proportion of males to females was the ratio of 6 to 1, and 65 per cent of the cases occurred between the ages of fifty and seventy years.

The most common symptom was pain, varying from an uncomfortable, heavy feeling, to an intense viselike sensation. The pain was of the type usually associated with coronary disease and angina pectoris, such as precordial or epigastric distress, with radiation into the upper extremities.

Attacks of respiratory distress were also frequently observed.

In 60 per cent of the cases the heart size was increased. Congestive failure was present in about 40 per cent, as evidenced by pulmonary and hepatic congestion.

Four types of clinical features were noticed:

(1) The heart normal in size, with normal blood pressure, and absence of cardiac insufficiency and congestive failure.

(2) Heart of normal size, with symptoms of congestive failure as well as cardiac insufficiency, but normal blood pressure.

(3) Cases of enlarged heart, with increased blood pressure, but with absence of congestive failure or heart insufficiency.

(4) Cases with cardiac enlargement, increased blood pressure, congestive failure, and cardiac insufficiency.

Of the 113 cases, 24, or 21 per cent, showed coronary thrombosis.

Thrombosis may be considered as a complication of coronary sclerosis, rather than as a separate clinical entity.

Dr. F. J. Hirschboeck.

CLINICAL VALUE OF SOME RECENT TESTS FOR LIVER FUNCTION: Howard F. Shattuck, M.D., John C. Browne, M.D., and Majorie Preston, A.B., New York (Abstract from the Am. Journ. of the Med. Sciences, October, 1925). The authors made tests in the various clinical conditions with the more commonly used liver function tests, including the Rowntree-Rosenthal test, icterus index, the van den Bergh and Fouchet tests.

In their experience the Fouchet test proved unreliable for detecting minor grades of bilirubinemia. The van den Bergh test had every advantage, and none of the disadvantages of the Fouchet test. The van den Bergh test was of particular value in the specific qualitative test for bile pigment to control readings of the icterus index in patients with latent jaundice. It also aids in distinguishing between hemolytic and obstructive jaundice.

The icterus index test is the most useful single functional liver test, for the following reasons:

(a) Its ease and rapidity of performance.

(b) In the diagnosis of cases of cholecystitis and cholelithiasis without clinical jaundice, in which event a latent bilirubinemia is oftentimes discovered.

(c) It helps to distinguish between obstructive jaundice due to malignancy and catarrhal jaundice by showing whether the jaundice is increasing, diminishing or stationary.

(d) In the diagnosis of hepatic disease per se it runs rather parallel with the dye retention test.

(e) It may serve as a guide to the treatment of syphilis with arsenicals, and the toleration of the liver to the drug.

(f) It will determine whether obstructive jaundice has been relieved by operation.

(g) It helps to differentiate the primary from the secondary anemias.

(h) It may indicate the degree of cardiac decompensation.

The Rowntree-Rosenthal test is thought to be of supplementary value, and is of greater value than the icteric index in estimating liver efficiency in cirrhosis and malignant metastases. It also is of value in estimating the operative risk in case of surgical intervention. Its greatest value lies in the diagnosis of the liver insufficiency in patients without jaundice.

Dr. F. J. Hirschboeck.

PEDIATRICS

SUPERVISORS:
CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS
ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

PROGRESS IN PEDIATRICS — REVIEW OF THE LITERATURE ON INFANT FEEDING FOR 1924: Rudolph Duryea Moffett, M.D. (Amer. Jour. of Diseases of Children. Nov., 1925). Richardson has proved by statistics that the breast-fed baby has five times the chance for life and health as the artificially fed infant. The best means of stimulating secretion is by nursing or by rhythmic expression of the milk by the thumb and forefinger, applied just back of the nipple. The so-called colic in breast-fed infants is often a hunger symptom, which may be verified by putting the child back on the breast.

One of the important steps in solving the problem of breast feeding is regular weighing of the child before, during and after the nursing; this indicates whether the child is getting enough milk. Breast milk may be increased by giving both breasts at each nursing, by increasing the intake of fluids, by proper exercise and by adequate rest.

Koeppe agrees with many authors that the qualitative analysis of milk is valueless. Constipation, diarrhea, loss of weight, pallor, feeble pulse, subnormal temperature and alterations in the blood picture are known indications of under-feeding.

Artificial Foods.—Sweetened condensed milk and powdered milk, for the feeding of infants in the tropics, had been investigated by Deeks. These canned foods proved satisfactory for normal growth in 90 per cent of the babies. The old theory that protein is difficult to digest now seems unreasonable.

Struthers, Gleich, Field, Mulherin and Marfan and his co-workers have considered the use of acidified milk, particularly for young infants with nutritional disturbances. This preparation affords an excellent means for treating athreptic infants and may be given in concentrated feedings, which overcomes much of the vomiting. After the administration of acidified milk, the acid of the duodenum increases in a half hour and persists for one hour. Buttermilk produces no increase in the acidity of the infant's duodenal content.

Butter Flour Feedings. — In reporting their experience with the Czerny-Kleinschmidt butter flour mixture, Schumacher, Wisch and Greenwald are convinced that butter flour is of value in feeding feeble and premature infants as well as healthy ones. For children with acute nutritional disturbances manifested by diarrhea, fever and loss of weight, the high fat feeding seems to intensify the condition.

Peristaltic Function. — Rogatz found that the infant's stomach reacts differently to fluids and to semisolids. When fluids are given, the stomach assumes either a pear or oval shape, horizontal in position, extending beyond the middle with a large air bubble. With food that is very thick, the infant's gastric organ contracts down to a small circular shape, barely reaching the middle line and never extending beyond it, with little or no air bubble present. These facts prove the necessity of more concentrated food in place of fluid feeding.

Metabolism.—In a study of the metabolism in undernourished infants, Fleming and Hutchison consider as causes of failure to gain: (1) defective absorption of food, (2) defective utilization of absorbed food in the tissue, and (3) excessive combustion of absorbed food.

R. N. Andrews, M.D.

PROGRESS IN PEDIATRICS — IMPORTANCE OF CONSIDERING THE BODY MECHANICS OF CHILDREN: Lucy Porter Sutton, M.D. (Amer. Jour. of Diseases of Children, October, 1925). In examining a child the physician investigates carefully the throat, the heart, the lungs and the abdominal organs. Too frequently he completely ignores the skeletal system unless there is a marked lordosis, an obviously protuberant abdomen or flat feet. Good body mechanics means that the body is maintained in such a position that there is no undue strain on any set of muscles or organs.

At the basis of poor posture lies the fact that our bodies were originally designed for the four-legged position, and we have not yet fully evolved a mechanically perfect two-legged state. Once the abdomen has started to sag, the other factors in poor body mechanics develop, namely, the flat chest, forward head, tilted pelvis, round shoulders, sprung knees and knock knees. When fatigue is added to these conditions, a vicious cycle is established—the more tired a person becomes the worse he stands; the worse he stands the more tired he becomes because of the undue and unqual muscle strain.

In children there are certain conditions which are definitely relieved or cured by correction of the body mechanics. These are: (1) Constipation, unless there is an organic lesion. (2) We frequently see patients who complain of vague abdominal discomfort. Many are completely relieved by correction of the body mechanics. (3) Cyclic vomiting. Postural treatment and avoidance of overfatigue are logical aids in preventing the attacks. (4) Enuresis. This is almost always a difficult condition to treat, but some children respond surprisingly to posture work.

Many of the children found in nutrition classes fall into the slender visceroptotic class and are frequently the ones who prove most refractory to treatment. When such children have their body mechanics improved there is almost always a gradual but steady gain in weight. Scoliosis and pronated feet are sometimes secondary to poor posture.

Besides these definite conditions, which are frequently corrected by improving the body mechanics, it is surprising to see the improvement in the general condition of the children.

Treatment.—The first essential in attempting to correct the body mechanics of a child is to explain to the parents and nurse the reasons for the need and to demonstrate the position of the body, which is most desirable. The mat-

tress of the bed should be firm, and no pillow should be used. If an underwaist is worn, the straps should go over the base of the neck rather than over the tips of the shoulders, as this is often an element in bringing the shoulders forward. Bloomers with elastic around the waist are bad. Side garters fastened to an improperly fitted waist exert a strong influence in bringing the shoulders forward. Children should have chairs which are of the proper size. In the case of small children and those with bad posture and malnutrition, it is advisable to insist on a rest in an overcorrected position, preferably after each meal.

The simplest position to take is lying on the back on a firm flat surface such as the floor, with a small roll or pillow under the lower part of the thorax. The hands are placed behind the neck, and the shoulders and elbows rest on the floor. The exercises used should have two aims: (1) to teach the child conscious control of the muscles, and (2) to strengthen the muscles so that when the proper position has been learned the child will be able to maintain it.

The results obtained are well worth the time and patience required.

R. N. Andrews, M.D.

A FREQUENT CAUSE OF DYSPEPSIA IN BREAST-FED INFANTS: Kirsten Utheim Toverud, M.D. (Amer. Jour. of Diseases of Children, November, 1925). Quite frequently, one observes breast-fed infants who, after doing well for the first few weeks or months of life, stop gaining in weight. and become restless and irritable. Vomiting, occasionally severe, may be the predominating symptom. Ultimately these infants lose weight, and unless proper treatment is instituted they become distinctly athreptic.

In the author's experience, overfeeding with breast milk is a rare cause of dyspepsia. Faulty composition of mother's milk does not seem to be a factor in the causation of the symptoms of dyspepsia. In a series of cases, the breast milk was analyzed and the figures for sugar, fat and protein were not found to differ from those of the milk of mothers whose babies were thriving.

In a group of thirty-three infants, in whom the symptoms enumerated were present, it was found in each instance that the mother was secreting an insufficient amount of milk. When suitable supplementary feelings were given to these infants, a prompt disappearance of the symptoms occurred regularly. Partial inanition may lead to a variety of symptoms, including weight loss, weakness and constipation, as well as dyspeptic symptoms.

Inanition is far more serious in the case of an infant than in an older person. The infant has a higher energy requirement as well as a greater need for material for building up new tissues. Furthermore, the infant does not store a sufficient amount of reserve food to supply its needs for any considerable time.

Nausea and vomiting are frequent symptoms of hunger, even in adults. Infants, in general, vomit more readily than older people, and with the marked hunger phenomena that they exhibit it is not surprising that vomiting should occur.

R. N. Andrews, M.D.

ROENTGENOLOGY

SUPERVISORS:
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MAYO CLINIC, ROCHESTER

REPORT OF 5,000 GASTRO-INTESTINAL EXAMINATIONS BY THE ROENTGEN RAY: Merrill (Am. Jour. Roent., V. 14, p. 310, Oct., 1925). 818 of these cases were explored surgically and these findings, the clinical diagnosis, and the *x*-ray diagnosis are tabulated.

There was a total error of 4 per cent in this group of cases as determined by operation. A positive error, that is the diagnosis of lesions not found at operation, of 1.2 per cent is reported. No gastric cancer or ulcer, found at operation, was missed by the roentgen examination. Three cancers of the colon were missed, due no doubt to failure to employ the barium enema in these cases.

In 551 cases, showing ptosis only roentgenologically, a clinical diagnosis of peptic ulcer had been made in 28 per cent and of cancer in 8 per cent. Only 15 of these were explored, but in none was gastro-intestinal pathology found, confirming the *x*-ray diagnosis in every case.

In duodenal ulcer, the roentgen findings were correct in 92 per cent of the cases, only one-half of these having been recognized clinically. In gastric ulcer, the roentgen diagnosis was confirmed in 93 per cent, the clinical diagnosis only in 56 per cent. In gastric cancer, the comparison is even more astonishing. A correct roentgen diagnosis was made in 95 out of 97 cases, 98 per cent; clinically 38 per cent were diagnosed cancer of the stomach, 18 per cent cancer of undetermined location, and in 44 per cent the diagnosis was either incorrect or not made.

Other outstanding figures were the correct diagnosis of appendicitis in 34 of 35 cases and of gall bladder disease in 32 of 34 cases. In 127 examinations of the esophagus, the roentgen diagnosis was confirmed in every case, either by esophagoscopy or operation. Clinically, 18 of 70 cases of obstruction, 13 cases of cardiospasm, and 6 cases of diverticulum went unrecognized. On the other hand, in 24 of 35 cases roentgenologically negative, a clinical diagnosis of obstruction had been made.

The report is carefully prepared and comes from the Massachusetts General Hospital. It emphasizes in striking fashion the vital importance and almost unbelievable accuracy of the roentgen diagnosis in diseases of the gastro-intestinal tract.

Leo G. Rigler, M.D.

IN BEHALF OF THE RELIABILITY OF THE NICHE IN GASTRIC ULCER DIAGNOSIS: M. Haudek (Fort. a. d. Geb. d. Roentgen., V. 33, p. 5, Sept., 1925). In gastric ulcer diagnosis, the niche is a perfectly reliable sign, if the entire characteristic symptom-complex is present. However, it must be emphasized that such a diagnosis, with the

niche as its basis, is safely made only in connection with lesions of the pars media of the stomach.

Criticisms regarding the relative value of the niche as a diagnostic sign are entirely based on faulty interpretation, as may be shown by a careful analysis of the cases reported. Thus there are frequent failures in the attempt to demonstrate the ulcer operatively, even though the roentgen picture is typical, this being due to incomplete exploration of the comparatively inaccessible posterior stomach wall. Lack of differentiation of the second portion of the duodenum from the gastric contour; calcified tumors or lymph nodes; left-sided nephrolithiasis; diverticulum of the duodeno-jejunal angle; true congenital gastric diverticuli—all these constitute pitfalls for faulty interpretation.

When the lesion is located on the lesser curvature of the stomach, the niche of gastric ulcer can always be differentiated from that of carcinoma, if the observations are very carefully made. The observer must here keep in mind the differential findings of ulcer and carcinoma in this particular region, with special reference, (1) to the contour and degree of irregularity, and the nature of the peristaltic waves of the lesser curvature; (2) to the base, size, shape, permanency of and retention in the projecting shadow; (3) to the width, the character of the outline, and the general direction of the incisura on the greater curvature.

With the statistics of Orator, as found in Eisclberg's clinic, as a basis, malignant degeneration occurs in 2 per cent of ulcers of the body of the stomach, in 30 per cent of pre-pyloric and in 0 per cent of duodenal ulcers. Diagnosis of such degeneration is dependent on the recognition of the slightest variation from the definite ulcer characteristics, coincident with the demonstration of signs simulating carcinoma.

Walter H. Ude, M.D.

EYE, EAR, NOSE AND THROAT

SUPERVISORS:
VIRGIL SCHWARTZ,
PHYS. & SURG. BLDG., MINNEAPOLIS
E. L. ARMSTRONG,
FIDELITY BLDG., DULUTH

TREATMENT OF PHLYCTENULAR INFLAMMATIONS OF THE EYE: Dr. Shinichi Funaishi (Mukden, Manchuria, American Journal of Ophthalmology, August, 1925, p. 618). Whereas various investigators had injected tuberculin or tubercle bacilli into animals and had later instilled some of the same substance into the conjunctival sacs of these animals and so produced phlyctenular inflammation of the eye, it had been concluded that the condition was essentially a tuberculous one. However, the writer has produced identical results by using instead of tuberculin, a staphylococcus vaccine, or a solution of tyramin hydrochloride or of casein. The substance common to all these and to tuberculin or the tubercle bacillus, is a protein foreign to the animal, which causes the general sensitivity of the animal (to these proteins) to react with a local manifestation in the eye. Therefore when a patient is sensitized to foreign proteins, as is the case in the scrofulous or exudative diathesis, or in gastrointestinal intoxication, in absorption of destroyed products of secretion in eczema, and in bacterial infections which deposit proteins in the blood, if bacterial or other foreign proteins should invade the conjunctival sac, a phlyctenular lesion may readily result.

Cow's milk may be used to improve the body resistance to the reactions of various proteins. Injection of one to four c.c., according to age, of fresh cow's milk, boiled three or four minutes, into the gluteal muscles produces only a temporary rise in temperature, and may be repeated every three or four days. The secondary fever diminishes each time until it does not exceed 99° F.

Virgil J. Schwartz.

STATISTICAL STUDIES OF THE CHILDREN IN THE CHICAGO PUBLIC SCHOOLS FOR THE DEAF: George E. Shambough, M.D., assisted by Alice K. Hall, M.D., W. E. Hagens, M.D., and J. W. Halderman, M.D. (Abstract from the Archives of Oto-Laryngology, November, 1925, p. 417). Two hundred ninety children from three public schools for the deaf in Chicago were examined.

An effort was made to determine the relationship between nose and throat conditions and the existing ear trouble. Only in a few cases could correctable nose and throat conditions be held accountable for the development of the ear trouble. The type of ear trouble was that of the internal ear or nerve deafness. Many had had tonsils removed previously without benefit to ear conditions.

This type of ear trouble could probably not have been influenced much by any efforts at prevention.

It is a fallacy that adult deafness is due to adenoids and hypertrophy of tonsils during childhood.

Congenital deafness numbered 119 cases. There was history of deafness in family in only 40 of the cases. Acquired deafness cases numbered 145. Of these 56 at the onset had otitis media. The deafness of this group was practically always referable to pathology of the labyrinth.

Meningitis was a cause in 25 cases. Scarlet fever was the cause in 14 cases. Mixed infection was the cause of 11 cases. Pneumonia was the cause in 9 cases. Diphtheria was the cause in 9 cases. Measles was the cause in 8 cases. Otitis media was the cause in 6 cases. Typhoid fever was the cause in 4 cases. Influenza was the cause in 3 cases. Fracture of the base of the skull was the cause of 3 cases. Whooping cough was the cause of 2 cases, and infantile paralysis was the cause of 3 cases. Mumps was the cause in 1 case.

HEREDITY

Under this heading forty-nine cases are reported. Some of these were due to syphilis, but in most of them the cause was not definitely determined.

E. L. Armstrong, M.D.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

LICENTIATES OF OCTOBER, 1925

BY EXAMINATION

Name	Medical College	Address
Armstrong, Harry G.	U. of Louisville, M.D., 1925	St. Paul, St. Luke's Hosppital
Balch, Franklin Greene, Jr.	Harvard, M.D., 1923	Rochester, Mayo Clinic
Bowles, John Herschel	Rush, M.D., 1925	Rochester, Mayo Clinic
Decker, Walter Joseph	Wash. U., Mo., M.D., 1923	Rochester, Mayo Clinic
Fenger, Ejvind Palmer K.	U. of Minn., M.B., 1924	Oak Terrace, Minn.
Fink, Leo William	U. of Minn., M.B., 1924	Minneapolis University Hospital
Giere, Richard Waldorf	U. of Minn., M.B., 1925	St. Paul, Hamm Building
Hedemark, Truman Albert	St. Louis U., M.D., 1925	St. Paul, Ancker Hospital
Heiberg, Emmett Anderson	U. of Minn., M.B., 1925	St. Paul, Ancker Hospital
Lindsey, Maude Louise	Wash. U., Mo., M.D., 1924	Rochester, St. Mary's Hospital
Olson, Chester Jerome	U. of Minn., M.D., 1925	Belle Plaine, Minn.
O'Reilly, Bernard Eugene	St. Louis U., M.D., 1925	St. Paul, Ancker Hospital
Paul, Louise Mary	U. of Minn., M.B., 1925	Minneapolis, 504 Ridgewood Ave.
Pierce, Alano E.	U. of Minn., M.B., 1924	Minneapolis, General Hospital
Shepard, Chas. Edward	U. of Minn., M.D., 1924	Le Mars, Iowa
Sundberg, Rudolph Herbert	U. of Neb., M.D., 1925	St. Paul, Ancker Hospital
Wahlquist, Harold F.	U. of Minn., M.B., 1925	Minneapolis, 3310 Fremont Ave. S.
Wall, Mark Henry	U. of Minn., M.B., 1924	Minneapolis, 510 Essex St.

BY RECIPROCITY

Bannick, Edwin George	U. of Ia., M.D., 1920	Rochester, 426 6th St. S. W.
Beach, Watson	Detroit Col. Med., M.D., 1924	Rochester, Mayo Clinic
Burling, Fred Temple	Rush, M.D., 1923	Decorah, Ia.
Chumley, Charles Lawrence	U. of Tenn., M.D., 1924	Rochester, Minn.
Cumming, John Frederick	U. of Toronto, M.B., 1922	Abercrombie, N. D.
Dugan, Lawrence F.	Marquette, M.D., 1924	Milwaukee, Wis., 320 Sycamore
Dworsky, Samuel David	U. of Minn., M.D., 1924	Minneapolis, 1228 Upton Ave. N.
Fahr, Geo. Edmeston	Wuerzburg, Ger., Dr. of Med., 1909	Minneapolis, 400 5th St. S. E.
Fawcett, Wm. Crozier	Western Ontario, M.D., 1901	Starkweather, N. D.
Greenlee, Daniel Paul	U. of Pittsburgh, M.D., 1924	Rochester, Minn.
Horton, Bayard Taylor	U. of Va., M.D., 1922	Rochester, Minn.
Hutchinson, Dorothy Wilder	U. of Pittsburgh, M.D., 1924	St. Paul, 2007 Portland
Hyslop, Orton Chas.	Northwestern, M.D., 1916	Marble, Minn.
Jacobs, Minard Friedberg	U. of Mich., M.D., 1923	Rochester, Minn.
Jensen, Julius	London, L.R.C.P., M.R.C.S., 1923	Starbuck, Minn.
Judge, Walter Thomas	U. of Iowa, M.D., 1924	Graceville, Minn.
King, Harry Thomas	Marquette, M.D., 1924	Minneapolis, 2607 17th Ave. S.
Lapierre, Jean Thos.	Creighton, M.D., 1924	Minneapolis, 303 E. Hennepin
McNaugher, Wm. McMillan	U. of Pa., M.D., 1924	Rochester, Minn.
Meng, Eleanor Lovejoy	Hah. Chic., M.D., 1910	Fergus Falls, Minn.
Meng, William Lucius	Hah. Chic., M.D., 1910	Fergus Falls, Minn.
Ortman, John Wessel	Creighton, M.D., 1924	Pierz, Minn.
Pugliese, Francis Michael	U. of Pa., M.D., 1923	Rochester, Minn.
Stuhler, Louis George	U. of Ia., M.D., 1906	Rochester, Minn.
Viecelli, James D.	U. of Colorado, M.D., 1923	Rochester, Minn.

NATIONAL BOARD CERTIFICATE

Anderson, Ernest Raymond	Rush, M.D., 1925	Minneapolis, 808 E. Franklin Ave.
Baumgartner, Conrad John	U. of Nebr., M.D., 1923	Rochester, Minn.
Eskew, Don Carlos	U. of Va., M.D., 1924	Rochester, Minn.
Fishback, Frederick Coleman	Harvard, M.D., 1922	Rochester, Minn.
Hurt, Holcombe Harris	U. of Va., M.D., 1924	Rochester, Minn.
Schutz, Elmer Scenas	Rush, M.D., 1925	Mountain Lake, Minn.
Whitten, Merritt Bryant	U. of Oregon, M.D., 1924	Rochester, Minn.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

MINNEAPOLIS, ST. PAUL AND SAULT STE. MARIE RAILWAY SURGICAL ASSOCIATION TRANSACTIONS, 1923. 235 pages. Published in Minneapolis, 1925.

INTRAVENOUS THERAPY: ITS APPLICATION IN THE MODERN PRACTICE OF MEDICINE. Walton Forest Dutton, M.D. 2nd revised and enlarged edition. 594 pages. 64 halftones and engravings. Cloth, $6.00. Philadelphia: F. A. Davis Company, 1925.

A TEXTBOOK OF PHYSIOLOGY. Wm. D. Zoethout, Ph.D., Professor of Physiology, Chicago College of Dental Surgery (Loyola University) and Chicago Normal School of Physical Education. 2nd edition. 616 pages. Illustrated. Cloth, $4.50. St. Louis: C. V. Mosby Company, 1925.

THE THERAPY OF PUERPERAL FEVER. Privatdozent Dr. Robert Koehler, formerly assistant of Gynecological Department of Krankenhaus Wieden, Vienna. American edition prepared by Hugo Ehrenfast, M.D., F.A.C.S. 276 pages. Illustrated. Cloth, $4.00. St. Louis: C. V. Mosby Company, 1925.

THE SURGERY OF PULMONARY TUBERCULOSIS. John Alexander, B.S., M.A., M.D., Assistant Professor of Surgery in the Medical School, University of Michigan. Introductions by Hugh Cabot, M.D., C.M.G., H.D., F.A.C.S., and Edward R. Baldwin, M.A., M.D. 356 pages. Illus. with 53 engravings and 12 plates. Philadelphia and New York: Lea & Febiger, 1925.

EYE, EAR, NOSE AND THROAT MANUAL FOR NURSES. Roy H. Parkinson, M.D., Visiting Oculist and Aurist to St. Joseph's Hospital, San Francisco, California. 207 pages. Illus. Cloth, $2.25. St. Louis: C. V. Mosby Co., 1925.

The purpose of this book is to supply a system of teaching eye, ear, nose and throat for the classroom in nurses' training schools. The author's correct contention is that in teaching nurses you are not training specialists and he has made the diction free and readable, nomenclature is simplified and technical discussions have been avoided. Illustrations from pen sketches by the author are clear and understandable and furnish good copy for "chalk talks" in lectures. The second part deals with operating-room technic and illustrations of the layout of instruments for the various operations. Problems of the public health nurses are discussed in the third part. This book as a whole is to be commended as a basis for lectures to the lay mind—how much to say or how little, how to say it, how to illustrate and make clear what we are saying.

T. J. MALONEY, M.D.

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THE CHARACTER AND RELATIONSHIP OF CRIMINALITY, DELINQUENCY AND FEEBLEMINDEDNESS*

R. M. PHELPS, M.D.
St. Peter, Minn.

It is to be presumed that everyone has certain ideas about criminality, delinquency and feeblemindedness. Frequent statements as to their relation are often encountered. It is my purpose to discuss certain phases of this subject rather briefly. The question is not wholly medical, but an application of philosophy and common sense judgments.

Criminality hardly needs definition. It usually refers to those who have violated the law and have been convicted. In a broader sense, however, it should also include those who are presumed to have committed offenses but have not been convicted by any court.

Delinquency is used to gather in those of loose moral principles and behavior and general carelessness and probable laziness.

Feeblemindedness, I am going to try and divide into two forms, although this is not customary.

Symmetrical feeblemindedness, the ordinary kind designated, refers to a general lack in all the spheres of the mind's activity—the lack of attention, the lack of judgment as one of the most prominent things, the lack of reasoning power and a lack of ability generally. The emotional state is not necessarily lessened or abolished, but it is usually under poor control. Rarely are there prominent delusions or hallucinations, exactly like those of the insane.

Then I would, for the purposes of the article, describe *asymmetrical* feeblemindedness. In general phraseology this would include persons in whom there were certain lines of considerable ability, but other lines either of feeblemindedness or of what are called perversions—perversions of moral state, perversions of sexual state, perversions of emotional state. This group is, of course, ill-defined and not fully and scientifically recognized and the patients are not always called feebleminded. Yet they are more closely linked to feeblemindedness than they are to insanity and, in my judgment, are most accurately grouped in this way. The central idea associated with imbecility is not so much the kind of talk and behavior, as that it is inborn—is a life-long trait.

This much for definitions. The question then arises, is feeblemindedness a cause of criminality and delinquency, or, conversely, does criminality indicate that the person is feebleminded or insane. Some of you will have read articles in the "World's Work" by French Strother detailing such latter connection. Taking up the first statement, I would express an opinion which naturally cannot be backed up by any exact statistics, that a feebleminded person may be either moral and conscientious, or immoral and criminal,—and I would assert that the feeblemindedness does not by any necessity or great probability cause criminality. There are quite a number of convicted criminals in St. Cloud and, to a certain extent, in Stillwater who are feebleminded. Of course, this feeblemindedness is usually of so high a level that they have been able to live outside up to the time of their crime. But it is my idea that there are in every community a considerable number of people who are living quietly, probably working and living conscientiously, who are more or less feebleminded of asymmetrical or symmetrical type. One who is familiar with the population of a town, especially a small town where all people are known, will recognize the fact.

Looking at it from the opposite direction there are at Stillwater and St. Cloud a few feebleminded of symmetrical type, more of an asymmetrical type, and they probably have some also of mild degrees of insanity. All these have been committed by the courts and therefore are not gross idiots or imbeciles.

*Read before the Nicollet and Le Sueur County Medical Society, December, 1924.

As to asymmetrical feeblemindedness, there have been, I believe, one or two prominent musicians (Ole Bull has been mentioned) who were talented in music and yet are said to have been feebleminded. There are, however, more of a different type, some of which are linked with insanity. Feeblemindedness grades up towards insanity.

I might mention an example of a young man sent to the Rochester hospital who was said to have once been on a lecture bureau committee. He was a fluent talker with a rather bright way about him and appeared unusually intelligent and quick. His history revealed that he had been in the habit of keeping company with girls, becoming engaged, making preparations for marriage even to the point of papering the house and selecting the furniture —and then failing to appear just at the last. He had moved from place to place and done this several times. It was hinted that he had had one or two affairs which were not so reputable. At the time of being committed he was married and his wife appeared. She had been deceived. In spite of his history of having studied medicine and various subjects it was demonstrated that although he went to doctors' offices he would not study. It was afterwards learned that from youth up he had been queer. He had certain sexual peculiarities, had had trouble at home, had been turned out of school because he failed to learn. His life had evidently been a succession of shams. Remember, that this man appeared unusually bright, intelligent and quick. Nevertheless, instead of thinking of this as a case of paranoia or pure perversion, I always thought of him as being born that way and constitutionally feebleminded of the asymmetrical type.

You have read of cases of sexual perversion. Instances of emotional perversion are reported. We have had two young men at St. Peter who had committed murder. One, who killed an aunt on the street for no known reason, was so intelligent that at first they would not commit him as insane. He had been arrested six months previous for bothering some girls, but had generally been quite well behaved. He did not show any moral compunction or regret and professed in an intelligent way that he did not know why he did it. A distant relative of his said he had always been an "owlish" sort of fellow, but we could obtain only the vaguest sort of idea as to his childhood state. His mental state was called paranoia, also dementia precox, but there were no paranoid ideas that I know of and I knew him several years. I always thought of him as belonging to an asymmetrical branch of feeblemindedness. However, one fact is in opposition to this classification in his case, I am forced to admit; for he gradually improved and finally left us in what was apparently a fair mental state.

You will not clearly get my idea as to mental states unless you admit something which legally is not supposed to exist and that is *degrees of feeblemindedness* as well as degrees of insanity. Legally, an individual is supposed to be either feebleminded or normal. Practically, we have grades of mentality ranging from the grossest idiot up through the moron and out into society. Out in society we hear a man spoken of as not very bright, another as having poor judgment, another as queer, odd or erratic; yet when we appear in court, we have to testify that a person is either feebleminded or normal, is insane or normal. The late intelligence tests, however, try to demonstrate a status almost mathematically graded from the grossest imbecility, which they hardly test at all, up to the normal and, in fact, on to the supernormal. In a way, the matter of gradation is fully admitted, but in general practice is not admitted and is not fully recognized legally anywhere.

Insanity has the same general aspect. An individual is insane or normal, just as he is sick or well. But everyone knows that "sickness" means anything from a trifling headache to a delirium and unconsciousness. When a physician testifies in court that a man is too sick to appear, it is practically admitted that the physician has made some judgment as to the degree of sickness. When a man testifies in court that a man is insane, no such admission of a degree is assumed, although there is somewhat of a gradation upon which to base such a conception.

If a given man at a given time has to be fully sane or fully insane, then insanity would be an instantaneous lightning-like change on one side of which he would be sane and the other insane. Manifestly, no such thing happens. Many cases are over a period of years growing into the mental state in which they are finally adjudged by the court to be insane. Or in the case of children. They are admittedly and quite manifestly not of mental standing below the age of one year. They are admittedly of age and sanity and mental ability

at the age of twenty-one. No one imagines that this change was instantaneous at any one time.

There is another complication in the case of insanity in that certain states of delirium, drunkenness, and certain better classes of epilepsy do not receive the name insanity, although a distinct mental change has taken place. In regard to this, a recent editorial, in connection probably with the trial of the murder of Frank in Chicago, asserted that soon experts will be able to adjudge the thirty-second degree of responsibility. This article was probably a little satirical. I wish to state, however, that we are not able as yet to set up a series of modified states in court and modified punishments to fit the states. Certain concessions are made sometimes on account of youth, etc., but they are not legally adjudged. It is probably best, at least for some years to come, to adjudge the person sane or insane as in the past; the same is true of feeblemindedness.

The proper procedure at present is exemplified by the case in which a doctor goes into court and certifies that a patient is too sick to appear. In a similar way we, according to present practice, go into court and testify that the person is feebleminded, meaning that he is too feebleminded to take a legal status as normal; or that the person is insane, meaning that he is not sane enough to have the legal standing of sanity.

Practically, this is what is done. Practically, also, a legal decision is based on what one can find out as to past behavior and talk. The feebleminded or insane person, moreover, who behaves all right and gets along all right with everybody is not disturbed.

Another essential idea to get, however, is that all this is a matter of opinion and must *necessarily be so.* One testifies to it as it being his *opinion* that the person is feebleminded or not. In making up his opinion, conceding that it is perfectly honest, he also in imagination establishes some standard by which he will say that the person adjudged feebleminded is on the wrong side of this standard or line of division. Of course, opinions may differ and standards may differ somewhat and thus opinions may not always agree.

The real fundamental, however, in all this is the conceding of gradations—gradation of feeblemindedness, gradation of insanity. Some thirty years ago I wrote an article outlining this and it received no debate or comment. I questioned a leading neurologist and he said the time was not yet ripe to consider such. No one denied it. People generally are afraid of the subject, obvious as the conception seems to us. Theologians are afraid of it because it tries to impair the essential element of individual responsibility. Legal elements are afraid of it because, fully recognized, it would confuse and impair legal decisions of responsibility. Society generally is not accustomed to consider or concede it and to the class who read and think very little, it might and would bring confusion of thought and impairment of feeling of responsibility.

Modified responsibility is as yet only conceded when we speak of little children or when we speak of the person who is obviously delirious. It applies in modifications of sentence in the cases of those who are youthful. However, recently, writers on eugenics and the tests which they have used have outlined all gradations from the idiot up to the super-intelligent and thus have made a wide opening wedge toward the admission of gradations. However, this does not yet appear in any legal proceedings. In a legal statement *everybody* wishes a *positive* statement and the witness or the physician also of necessity makes the statement positive, as is exemplified in the case of a physician testifying that the man of bodily sickness is unable to appear. There seems to be no very practical way of getting away from this. If in the case of bodily sickness, for example, the physician would go on the stand and testify in a half-hearted way that the person, if he was obliged to, *could* understand something—*could* sign papers or *might appear*, neither the court nor the people would wish that sort of talk. He must be decisive one way or the other.

Now, in conclusion, I will admit that this subject came to mind in connection with the murder of the boy Frank by the two young boys in Chicago and from the reading of the various comments. It is a perfectly feasible and allowable question to ask: Were these two boys responsible and should they according to law have been put to death? Of course, not knowing the two boys and their history, I cannot make any positive statement. I would state, however, that I thought they ought to be hung as guilty of the most cold-blooded and cruel murder ever discovered. I, however, said this because I think their hanging was for the safety of society and because escaping execution

by reason of plenty of money and smart lawyers is very greatly to the detriment of society and may have far-reaching bad effects when so prominently advertised.

You will perhaps say, however, that the main question is: Were these boys in any way mentally affected? Here again I am going to dodge a little, also because I do not know them and because the newspaper testimony was not fully decisive and left out the historical aspects of the cases. I will admit, however, the existence of occasional cases of asymmetrical lack of emotional normality or probably also of moral normality. The newspaper evidence in this case did not make it seem to me clear that these two boys were entitled to such concession. In our general idea of normal, however, their minds could not have been perfectly normal, because the crime itself contradicted what we consider a normal way of thinking, in its lack of object and lack of moral emotion. But if we adopt this way of thinking no planned crime of murder would be normal. We don't punish because of normality or abnormality, because of perfection or imperfection. My point is that I do not wish in any way to shield criminals because of such deviations from the normal. Criminals are punished not for themselves, but for the sake of society. If these two young men were hung it would not have been for themselves at all, but for the protection of society. Even if we should concede a somewhat considerable deviation from the normal state, I would not advocate any remission of penalty.

I would conclude by a quotation from H. C. Wood on the subject of psychopaths in Pepper's "American Text Book of Medicine," 1893: "Perverse drifting almost of necessity into criminal eccentrics, such unfortunates are a long series of human atoms, whose faulty brain organization separates them from their more fortunate fellows. When this separation is sufficiently wide, when the mental organization is so bad that everyone can perceive that the man is the victim of his own imperfectly developed brain, he is said to be insane. But when the unfortunate individual is a little more like the normal human being, he is looked upon simply as eccentric, perverse or wicked, and, unloved or pitied, drifts through life, sometimes to poverty, sometimes to the hospital, sometimes to jail, and it may be to the hangman's scaffold. Sanity, insanity, criminality, power over self, free will, mental attributes—these and similar terms are household words with all of us, but no man knows whence they came, or what they are, or how far the individual is master of himself or driven by the hand of fate, as represented in the physical conformation of the nerve cells and fibres of the brain."

Many physicians have envied Sir William Osler his easy command of English writing. In the Osler Library is a collection of some of his manuscripts, showing the various stages in their preparation. First are notes on paper of various kinds, evidently written on trains and at opportune moments; then a rough outline in longhand; next the first typewritten copy with interlineations, transpositions and deletions; then the second typewritten copy, which also bears evidence of much modification, and, finally, a third typewritten copy, which evidently was used by the printer. Even this copy has three or four minor corrections.

Anatole France, Nobel prize winner in literature, said that seven revisions are necessary and an eighth desirable, in order to make sure that the corrections on the seventh have been understood. "In the first," it has been said, "he enlivened what had been platitudinous. The second was for 'weeding out the dandelions,' whos, whiches, and whoms. In the third, he eliminated the semicolons, shortened his sentences, and struck out phrases which merely linked one sentence with another, or marked a transition from one thought to another, a task that should not be left to the reader. In the fourth draft he gave special attention to the order of sentences and to the repetition of the same word; he looked on the recurrence as a warning to rewrite the sentence, not to search for a synonym. The fifth draft saw the disappearance of adjectives, for he was of the opinion of Voltaire, that though the adjective might agree with the substantive in gender, number and case, very often it did not suit it. From the sixth draft he chipped away what he called the pastry, all that was adventitious and redundant, and over the seventh draft he passed the plane, for, he said, a good writer is like a good cabinet maker—he planes his phrases smooth."—George H. Simmons and Morris Fishbein, Jour. Am. Med. Assn., May 16, 1925.

ASEXUALIZATION: A REMEDY FOR CRIME AND CRIMINALITY*

J. H. James, M.D., F.A.C.S.
Mankato, Minn.

Much is being written concerning increase of crime and its cause, jurists asserting that the United States is the greatest criminal nation on earth. This is a terrible indictment and is in marked contrast to the situation one hundred years ago, when we were noted as the most moral and least criminal of nations.

Such impeachment raises the question as to what we are coming to if we continue to slip backward in this manner and what will happen to us in another hundred years? Are we complacently looking forward to another heavenly visitation with the hope that the wise ruler of the universe will make an exception in our case? If so, then we have another guess coming.

In 1876 the writer's attention was first attracted to this subject in a pamphlet which fell into his hands, advocating asexualization as a *remedy and punishment for crime and criminals.*

Later, in 1888, Dr. Orpheus Everett called attention to the procedure in an address before the Cincinnati Academy of Medicine; again in 1894, Dr. F. L. Senn read a paper before the Tennessee State Medical Society and on both occasions it met with approval. In 1896, I had the privilege of calling the attention of the Minnesota Valley Medical Society to the subject, but nothing definite followed until 1897, when the Indiana legislature passed a statute legalizing asexualization, and, we are told, 188 inmates of the Jefferson Penitentiary were operated. However, the governor then in office, disapproving, presented the matter to the supreme court, which declared the law unconstitutional and the remedy was therefore abandoned.

Recently, we are informed, sixteen states have taken up the matter suggested as a means of curtailing certain undesirables, and have enacted statutes permitting sterilization of idiots, imbeciles and lunatics when they become wards of the state or when permission by parents or guardians is obtained. Minnesota, after wrestling with the problem, at its last legislative session joined the procession; but nowhere do we learn that any state so far has included the class of the greater menace —the criminals.

We believe that many criminals are without question the victims of inheritance where the tendency may have remained dormant throughout several generations and in some of whom it might be difficult to trace; but more generally the manifestations have been active.

Scientists have given us to understand that there is in every life-giving cell a certain characteristic inheritance, but that environment, cultivation and education may modify or prevent its manifestation. When left to himself, however, each individual reverts to his original inherited characteristic.

Since every effort as yet instituted during the last 6,000 years for crime control has been futile, is it not time that we bestir ourselves and try some new method and see if we cannot reach the fountain head—"the mare's nest" as it were—and stop the propagation of criminals? We believe the time is ripe for an innovation and that every state should institute some such means by law enactment and enforcement.

In asexualization, we have at hand a sure means of curtailing propagation, and a deterrent, efficient as any other known means, if not superior to even the death penalty, so frowned upon by super-sensitive philanthropists.

The voluntary deliberate criminal by his own wilfulness and acts voluntarily deprives himself of any civic rights or sympathy. As long as he is unrepentant he is an enemy of society, the state and nation.

Jurists who have studied the primary causes of crime call attention to the growing apathy of the public towards punishment of law infractions and an unwillingness on the part of a majority of our people to respect the laws themselves, or to teach their children respect for lawfully constituted authority. Perhaps much of this apathy is due to our having too much law; we have become surfeited with it. We have only to glance at the tendency of our past legislatures and the number of new laws they have enacted. The majority of us do not and cannot know what the laws are and thus cannot avoid incurring penalties.

Such, however, are not the only reasons why crime is rampant. We have in the past been altogether too lenient as to who should be admitted from other shores to our own. Many came seeking a haven from prosecution or escape from the re-

*Read before the Blue Earth County Medical Society, Mankato, Minn., September 28, 1925.

sults of misdeeds abroad and have mingled with our own undesirables to multiply ad libitum. It is high time we called a halt to this.

Maudlin sympathy should bear no weight when degenerates or criminals forfeit liberty and citizenship by their conduct. I speak of the deliberately wilfully disposed, not of the one who may have broken the law through misfortune or accident and who may, through repentance or mild punishment, reform.

The laws of the jungle and of criminal gangs are strictly enforced. Why should society be any the less tolerant or lenient towards its enemies?

The betrayer of chastity should forever carry the brand of Cain on his brow and be corralled, castrated and turned loose, to be frowned upon by every passerby. It may be noted that in Biblical times eunuchs held important and responsible positions and were esteemed worthy.

The expense incurred arresting, paroling, convicting and caring for criminals is appalling and will, if the present rate of increase obtains, soon cause bankruptcy of our great and glorious country. From Literary Digest columns we glean that such activities are costing the United States ten billion dollars a year and that of late the increase has been a billion a year. How much longer can we stand this strain and burden or tolerate the cause which necessitates this outlay in supporting criminals.

A single illustration among thousands suffices to show the results in one family in which, in eight generations, were born 180 illegitimate children, 233 notably immoral women, 190 men, of whom nineteen were epileptics, twenty-four insane, and forty states-prison and jail convicts. New York spent $89,000 arresting, jailing and caring for forty of these who became denizens of her jurisdiction.

Our jails and reformatories necessary under present conditions are inadequate and prove postgraduate schools for newly admitted inmates, perfecting them in the intricacies of modern methods of operating, in avoiding capture and punishment, and in providing means of escape from the clutches of law.

Three years of intimate observation of a large reform school taught the writer of the almost useless efforts of reformation by aggregation, and its disadvantages compared with individual segregation of such inmates. It was our privilege to have had four paroled inmates in our family, each of whom of their own accord admitted that they learned more cussedness and devilment within the walls of the institution than they ever knew or suspected previous to their admission.

Municipal and state authorities do not hesitate to quarantine lawfully against contagious and infectious diseases; why not then against these other agencies more destructive than plague or pestilence whose ravages are unceasing through hereditary descent?

To those who for any reason oppose the death penalty for any crime, no matter how heinous, we suggest this method as a substitute, in the belief that the majority of such would prefer the death penalty. The plea that such action interferes with personal liberty has no force, for such an individual by his own act has already forfeited all liberty of choice or action whatever.

Laws are supposed to be enacted for the protection of the masses and not for individuals who by chance or volition become a law unto themselves.

Marriages of defectives should be prohibited and the law as sternly enforced as are nature's unlettered laws. When the career of each defective has ended, society will then no longer be perplexed and burdened by that individual.

"No pestilence that ever walked in darkness, or destruction that wasted at noonday, has ever done greater harm to mankind than the ever destructive power of hereditary degeneration of brain and mind." Such are the expressions of a noted alienist, before mentioned, as long ago as 1888, and, as yet, but little has been accomplished by the profession in the eradication of this deadly menace, in comparison with what has been accomplished in amelioration of disease, and in prophylaxis. While crime virus is more potent than any other and has greater destructive powers, we have given it but little attention. Continued neglect will certainly bring at no distant day the misfortunes which befell Sodom and Gomorrah.

So great has become the demand and necessity for housing the erring, in our attempt thereby to protect society, that our jails and reformatories and asylums are overflowing and we have been unable to cope with the demand. By the means suggested, those guilty of rape become altered beings and are thus spared to ruminate on the past and speculate on the future, unhampered by un-

restrained lust or passion; for the constitutionally depraved, it promises slowly but surely to diminish their number, to the extent of its application, by destroying reproductive possibilities and transmission of imperfections to coming generations.

We believe those who attribute criminal increase to the late war to be in error; for few, indeed, are the malefactors among returned soldiers, who, if they were capable of learning anything in the service, learned respect for authority, self control and obedience. Such is seemingly lacking in the criminal class which we are told is largely made up of the youth of today who were mostly too young to have served in our late war.

Total moral depravity has been said by some to have no existence. This I believe is a mistake, as any one who has had much experience in reform school work will have to admit. I once knew one who was not loth to speak emphatically of his conviction on this score, but a three months' employment as yardman in a reform school convinced and converted him entirely.

For such depravity there are only the alternatives of annihilation, life confinement or emasculation; there is no reform.

Switzerland and Italy have been practicing sterilization for years and have thereby eliminated many of their dependents. Why may we not be even as successful and even go them one better by applying it to the criminal classes, also?

I opine that only ultraconservative minds will object, for even they make no objection to its being cruelty to animals when applied by breeders in a preservation of the fittest, and in making the unmanageable obedient and willing servants of man. The vicious and uncontrollable bull becomes the patient stag and why may not the same remedy restrain unruly man?

Glancing back over fifty years since my attention was first called to this remedy, I observe that but little attention has been given to the subject and that principally by members of the medical profession. They too have been somewhat slow in adopting it as a means of preventive medicine to the same extent as they have been interested in preventing disease, and as a class I think have not given the matter the attention it deserved.

I am pleased to note that the public and the press of late have become interested in advising ways and means of curtailing crime increase and are advocating more strenuous measures of punishment and more activity in bringing offenders immediately under the ban of law.

The need is urgent and it is my belief that when the powerful factor of public opinion is sufficiently aroused, it will unitedly enter into the educational ranks to stimulate action sufficiently to abolish what has heretofore seemed an impossible task by devising some new methods which will be effectual; in asexualization they will find a potent remedy.

BERLIN WELCOMES AMERICAN PHYSICIANS

To the Editor:

We wish to call your attention to an article appearing in the Journal of the American Medical Association, January 16, Department of Foreign News, under the title, "Berlin Faculty Decides Against Official Welcome to American Physicians," copied from a German Medical Journal, dated December 11, 1925.

The reason given by the Faculty of the Berlin University for this action was on account of the exclusion of German physicians from taking part in International Medical Congresses.

There is no doubt that this was the attitude taken by the Faculty of Berlin last fall, but many things have transpired to strengthen our International relations since that time. The condition at the present time is entirely different.

The first of this month we received assurance from both the German Government and the Faculty of Berlin that the members of the Inter-state Post Graduate Assemblies, who will visit Berlin, June 15, 16 and 17, will receive a most hearty welcome. These greetings were received following several months of discussion between the representatives of the German Government, the Faculty of the University and representatives of this Association, especially with Dr. Carl Beck, Secretary of the Foreign Assemblies of this organization, who is now in Europe completing the final clinic arrangements for the 1926 assemblies. . . .

Following the publication of the article above mentioned, we cabled Professor Bier, the chairman of the Berlin clinic committee of this Association, to give us a statement so that we could speak authoritatively. The following is a copy of Professor Bier's answer:

Berlin, January 21, 1926.

"William Peck,
Freeport, Illinois.

Under the stated circumstances heartiest welcome. Letter follows.

Bier."

In bringing about this understanding we believe we have advanced largely the spirit of International good fellowship in which this organization is deeply interested.

Very sincerely yours,

William B. Peck,
Managing-Director
Inter-state Post Graduate Assemblies.

ANTI-TUBERCULOSIS WORK IS WINNING*

H. Longstreet Taylor, M.D.
St. Paul

Forty years ago the profession of medicine was awakening to a realization of the fact that Koch's discovery of the tubercle bacillus and his classical demonstration that tuberculosis was a communicable disease had laid a heavy burden upon their shoulders. Villemin's experimental proof of the communicability of tuberculosis had been known since 1865. A century before Koch's discovery, the kingdom of Naples had declared phthisis to be a contagious disease and attempted to obliterate it by the most stringent and oppressive laws—burning their habitations and destroying their personal property, thus making outcasts of all consumptives. These measures failed because the cause of the disease was unknown and every shot was fired in the dark.

In the twentieth century anti-tuberculosis crusade no such excuse is possible. Have we succeeded any better than the Neapolitans did in the eighteenth century? There are a number of people who say we have not.

We are accused of illogical reasoning and of inaccurate methods. Many claim that the widespread and continuous decline in the general death rate in the past seventy-five years explains the decrease of tuberculosis deaths. Others maintain that this decrease is due to a diminishing virulence of the tuberculosis germ, although a diminishing virulence has never been shown in laboratory work. The improvement is ascribed to progress in social and economic conditions, better water supplies, sewage disposal, and a higher standard of living generally. The claim is also put forth that an inherited immunity has finally come to the rescue of mankind, although throughout the centuries that tuberculosis has preyed upon the human race no trace of such development had appeared. Laboratory animals can be immunized, but not in utero (Krause).

The statistician has also put his oar into these troubled waters and has discovered that the efforts of the health authorities to curb the morbidity and mortality rates have been without appreciable results, and that the rise and fall of the tuberculosis death rate has behaved in many ways like that of other communicable diseases.

The explanations of the declining death rate are at times contradictory. Early in the century anti-tuberculosis work was criticized because the eugenists declared that if our work succeeded the results would be a great reduction in the average health of the public. The offspring of the unfit and sub-standard individuals, who had been cheated of their right to early graves, would greatly lower the average resistance of the race both against tuberculosis and other diseases. But today we hear that the lowered death rate is quite evidently due to an increased inherited resistance, since tuberculosis has become all but universal.

It behooves some of us, who have dedicated our lives to this work, to take these criticisms very seriously, to analyze them dispassionately, and to see if our work has been nothing but propaganda while the real gains have come about quite in accordance with natural development and without any assistance or speeding up from us.

Koch's discovery of the cause of tuberculosis turned an army of research men to work on every phase of the subject. This enormous amount of work so rounded out the exact knowledge of the life history of the bacillus of tuberculosis that a scientific basis for an international scheme of prevention was gradually evolved.

Today the following program has been adopted at least in those countries where anti-tuberculosis work has been markedly successful:

1. Notification of all cases to health authorities.
2. Free sputum examinations by public laboratories.
3. Tuberculosis dispensaries.
4. Sanatoria for the treatment of incipient cases.
5. Preventoria for the treatment of infected children.
6. Hospitals for the segregation and treatment of far advanced and dying cases.
7. Working colonies for arrested cases under medical supervision.
8. Follow-up work on all cases uncovered by the above activities: examination of contacts; discovery of new cases; supervision and instruction of discharged cases.
9. Education of the public.

*Read at meeting of the staff of the Lymanhurst School, Minneapolis, November, 1925.

10. The control of bovine tuberculosis: testing herds of cattle and pasteurizing milk supplies; official inspection of slaughter houses and their products and of food handlers.
11. Child welfare work also belongs here.

The notification of all cases to the health officer for registration and sanitary supervision is the foundation on which all epidemiological tuberculosis work is founded. The follow-up work and examination of contacts uncovers many more cases. Endemic centers in large cities cannot exist under the publicity which follows these investigations. Such, for example, as the infected Philadelphia houses reported by Flick, the houses of death so designated by the authorities of Paris, and Sir Robert Philip's nests in Edinburgh.

The greatest assistance is offered by the public health authorities in the free sputum examinations by state, county and municipal laboratories, both to the practitioner and health officer.

The public dispensaries, working with the health authorities and their follow-up agents, accomplish the same epidemiological work of recording cases and examining suspects; in short, of going out and finding the tuberculous population.

The clinics conducted in the rural districts by the anti-tuberculosis and public health associations, supported in the United States by the sale of Christmas Seals, are performing the same service for the farmer and settler in sparsely settled regions as dispensaries do in the cities and towns. A county nurse to follow up the cases discovered in the rural clinics is absolutely necessary if all contacts are to be examined and the patients persuaded to be treated.

The public sanatoria for the incipient cases is the next step beyond the dispensary and rural clinic. The only alternative is home treatment. Home treatment is a misnomer. Among families ignorant of the rules of hygienic living, as the majority of people are, whether rich or poor, home treatment usually leads to dissemination among all the susceptible members of the family and offers but little to the patient.

The experience of the last two generations has founded the tremendous advantages of the sanatorium treatment upon a rock far more secure than Gibraltar both as to results for the sufferer, the protection of the other members of the family, and from the standpoint of the public health authorities.

Preventoria for infected children is the fifth article on the list. It is also a strictly sanitary measure and has a high coefficient of usefulness in an anti-tuberculosis crusade.

Preventoria admit undernourished, poorly developed children, who have been in contact with open cases of tuberculosis in their homes or elsewhere. These children all show a positive von Pirquet reaction, but are not clinically active cases of tuberculosis.

Preventorium cases, if not discharged too soon, usually remain well through the years in which tuberculosis is most apt to appear. The preventorium is too young for statistics to have accumulated over a sufficient space of time to show more than this.

Hospital care for the far advanced and hopeless consumptive, the sixth subdivision of our program, is of the greatest importance from a public health standpoint. It is only while being hospitalized that these unfortunates cease to be a distinct danger to their families and friends.

Just as rigid quarantine of all cases of smallpox and of all contacts is an epidemiological measure, so is the care of these advanced cases in hospitals, and the search for other cases among contacts. General hospitals are awakening to the need for and value of hospital accommodation for this class of patients.

There are now between 65,000 and 70,000 beds in institutions in the United States for the care and treatment of consumptives. This large number of beds saves many lives, and prevents many infections by the segregation and instruction of this army of patients.

A properly trained conscientious patient is a safe inmate of any home.

In Minnesota all county and district institutions are required to give precedence to advanced cases. The State Sanatorium is reserved for incipient cases and, as far as possible, the advanced case is excluded.

Working colonies for arrested cases under medical supervision, or as a department of a large state sanatorium, round out the plan and insure the ex-patient from relapses.

Follow-up work, under the banner of the sanatorium, to keep in touch with its ex-patients and to guard them from the excesses and indiscretions

that lead to relapses, is not nearly as effectual as the working colony, because, necessarily, the supervision is intermittent.

The education of the laity on the nature of the disease, the necessary anti-tuberculosis measures and the results already obtained, is a vital provision. Only last year the National Tuberculosis Association reaffirmed the value of the old anti-spitting campaigns and urged the continuation of such efforts. They were of great value not only from a hygienic standpoint but also from that of refinement and good breeding. The same kind of work must be continued, especially among children--teaching the liberal use of sunshine, fresh air, sports in the open, proper food, and last, but not least, long hours of sleep. The housewife must be taught home economics and the modern science of nutrition to make this more effective. This education must be given from the lecture platform, by the social visitor or district nurse, by radio, in the movies, in the daily papers, in public health periodicals published for circulation among the laity such as, Outdoor Life, Hygeia, The Northwestern Health Journal, and others, and during the seal sale annual sermons on this subject would be appropriate from every pulpit. In short, wherever and whenever an audience, interested in this subject, can be gathered together, a speaker competent to give the facts of its occurrence and means of propagation should be provided.

Human and bovine tuberculosis are very closely related. Since dairy products and fresh meats are found on every table, the presence or absence of the bovine bacilli in them is a matter of the highest importance. The tuberculin-tested herds and pasteurized milk and inspected packing and slaughterhouses have proved to be safeguards against the infection of children from these sources. How successful these safeguards are is demonstrated daily in the clinic and dispensary where tuberculous cervical lymph nodes, for instance, are now met with very infrequently when compared with their prevalence twenty-five years ago.

Every one of these items in our program is both in the interest of the individual sufferer and an aid to the work of the health authorities.

Has this program, when efficiently carried out, shown positive results?

This entire program is a liberal education in hygienic living. The open-air sanatorium, preventorium, school rooms constitute object lessons to the communities in which they are located. The follow-up workers are health instructors in every family they enter. The education of the laity through the written and spoken word has proved to be a powerful force that has seldom been called on in vain. The end result must be to lower morbidity rates from many diseases and thus indirectly to lower the general death rate.

Dr. Louis I. Dublin of the Metropolitan Life Insurance Company's staff says: "The acceptance by the general public, as well as by the professional health workers, of the proposition that the health program has been effective is based on solid rock. It is right and wise that communities shall tax themselves more and more heavily to prevent disease and to prolong life. There will be troubles enough for health officers to obtain the support of their communities in view of the ignorance and lethargy of the uniformed and of the opposition from the blind cults whose program is anti-health. It is a pity that in the struggle, always difficult, for the adequate support of health activities, there should be need also to meet the criticism of the devotees to science and truth, and of the very teachers of the new generations of health officers. Man's greatest achievement in the last half century should not be belittled without reason."

These critics Dr. Dublin refers to usually declare and quite logically, considering their standpoint, that a recrudescence of the high mortality rates of the past may be expected. Unless this happens their disciples will soon begin to doubt that they have been sitting at the feet of prophets.

In New York City the fall in the tuberculosis mortality from 1910 to 1920 amounted to 55 per cent. It was due to an intensive co-ordinated campaign including all branches of anti-tuberculosis work: registration of all cases; sanitary supervision throughout the course of the disease; laboratories; municipal sanatoria; forty-one clinics; nursing service with instruction of cases in homes; two hospitals and a subsidized private hospital; a number of beds reserved in the State Sanatorium in the Adirondacks; one hundred and twenty open-air classes for children; preventoria; education of the public by local, state, and national tuberculosis associations, resulting in the population of the city actually aiding the authorities in waging war on tuberculosis and the causes predisposing to it.

The Tuberculosis Committee of the City of New York, however, declared that specific measures

were secondary to fundamental changes in environment and habits, largely brought about by their education of the public. Taken in conjunction with the results which have universally followed the successful application of such an anti-tuberculosis program in other places, it is safe to say that if they had not put on their specific and wide-flung campaign the reduction would not have been anywhere near 55 per cent.

Sir Robert Philip of Edinburgh writes: "During fifty years, while the death rate from all disease was reduced by less than half in Scotland, the tuberculosis death rate was reduced by two-thirds." He points out that this decrease increases, from decade to decade, from 17 per cent in the first to 27 per cent in the fifth. This is also true for the United States. The 1900 rate was 195, the 1910 rate was 165, and the 1920 rate 112, or 46 per cent less than that of 1900.

If this decline be due to natural causes or to the generally improved hygienic conditions, why is it most marked where the most intensive anti-tuberculosis work has been done?

Dr. J. H. Elliot of Toronto says: "Now a word as to the possibilities of organized effort in the control of tuberculosis. The Framingham demonstration has shown what can be accomplished in a short time by intensive effort. Similar results may be obtained in any community without undue expenditure of public funds. Our experience in Toronto amply confirms this. We have in Dr. Hastings an energetic health officer, who has preached for years that public health is a purchasable commodity, that with a well organized service the death rate may be lowered in proportion to the public funds reasonably expended for the combat of such infections as tuberculosis."

"There are sanatoria and hospitals for early cases and for advanced cases, hospitals for tuberculous children, preventoriums, open-air and forest schools for those not clinically tuberculosis, clinics for diagnosis, treatment or other disposition of cases, visiting nurses for supervision and follow-up, a system of compulsory notification which is the start of a search for contacts and sources, associations of clinics to secure uniformity and avoid duplication of work, auxiliary associations to aid the poor in their homes and provide for families in which the breadwinner is ill, with other agencies for the discovery, control, and prevention of the disease. In 1900 Toronto's death rate was over 250 per 100,000. Now with a population of 600,000 its rate is sixty-five per 100,000, the lowest death rate of any of the larger cities in America."

Dr. Frank Billings, in an address to the Minnesota State Medical Association in 1925, said: "There were 76,298 deaths from tuberculosis in the United States in 1921, a decrease of fifty per cent of the annual deaths in twenty years. This result has been due to a consistent, constant anti-tuberculosis campaign, characterized by rational individual hygiene and splendid medical management."

Haven Emerson declares: "That the wide discrepancies in the burden of deaths tolerated by different communities are not accidental, but result from controllable factors of environment and human relationships, is known to physicians and economists.

"The reductions where they have occurred are due, and in proportion, to the consistent effort and intelligent direction in the prevention and treatment of the disease."

Dr. Robinson Bosworth, in his report on the anti-tuberculosis work of Minnesota, points out that the death rate of counties, without a county institution, or the clinical and educational work done by the staff of each county institution in its own district, but with the State Sanatorium for its favorable cases, had a fall of 17 per cent in five years. In those counties that had both a county and state institution the fall was 27 per cent in the same space of time, showing that the percentages rise and fall with the amount of work being done in different localities.

In the last ten years, during which time the number of beds has passed the annual number of deaths, the decrease in the tuberculosis mortality of Minnesota has been 37 per cent.

Take the marvelous results of the Framingham demonstration, which shows a decrease of 68 per cent in the tuberculosis death rate as compared with the pre-demonstration period, which, to be thoroughly appreciated, must be cmpared with the decrease of 32 per cent in control towns. The Milbank Memorial Fund, encouraged by these successful examples, is doing the same work on a much larger scale.

Professor Allen K. Krause says: "The most remarkable chapter in the history of medicine is

the one detailing the achievements of the anti-tuberculosis work. No such record of the deliberate planning and carrying through successfully of an attack upon a widespread plague can be found in medical history."*

The International Anti-tuberculosis Campaign is a success. It has more than justified itself wherever it has been properly applied. This has only been done in communities anxious to co-operate in every way and willing to pay for the enormous benefits it offers.

*From the lecture delivered to the Koch Society, Chicago, October, 1925.

THE COUNTRY DOCTOR

If you can set a fractured femur with a piece of string and a flatiron and get as good results as the mechanical engineer staff of a city hospital at 10 per cent of their fee;

If you can drive through ten miles of mud to ease the little child of a deadbeat;

If you can diagnose tonsillitis from diphtheria with a laboratory forty-eight hours away;

If you can pull the three-pronged fishhook molar of the 250-pound hired man;

If you can maintain your equilibrium when the lordly specialist sneeringly refers to the general practitioner;

If you can change tires at 4 below at 4 A. M.;

If you can hold the chap with lumbago from taking back rubs for kidney trouble from the chiroprac:

Then, my boy, you are a Country Doctor.—*H. W. Davis, in the Kansas Medical Journal.*

Incitamin Not Acceptable for N.N.R.—In the information submitted to the Council on Pharmacy and Chemistry by Lehn & Fink, Inc., it is stated that Incitamin is a "standardized preparation of equine saliva, freed of coagulable substances"; that "each cubic centimeter contains 12 units of Ptyalin"; that it is preserved with 1 per cent of chinosol. It was stated to be indicated in the treatment of indolent ulcers. Entirely different statements as to the composition were made on the trade packages and advertising. Here it was stated: "Incitamin is a mixture containing saliva (equine), serum (also equine), and pancreatic extract. . . . It is preserved by the addition of one-half of one per cent of phenol." The Council found Incitamin unacceptable for New and Non-official Remedies because the statements of composition are contradictory; no data are given as to the amount of equine serum and pancreatic extract present; no data of any kind are given that the ingredients (whatever they are) have any action (except perhaps the phenol or chinosol); and so far as the evidence goes, it is an absurd and unscientific mixture. When the Council's statement was sent to Lehn & Fink, Inc., the firm replied that Incitamin formerly contained "saliva, equine serum and pancreatic extract," but that the formula had been changed to a "standardized preparation of equine saliva." (Jour. A. M. A., Dec. 12, 1925, p. 1907.)

X-RAY STUDIES OF INTESTINAL TUBERCULOSIS*

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The commonest and most dreaded complication of pulmonary tuberculosis is intestinal tuberculosis. The infection in most cases is from bacilli swallowed in the sputum. Recently it has come to be realized that intestinal involvement frequently occurs in moderately advanced and even in some early pulmonary cases. Its onset may be unheralded and when such classical symptoms as persistent diarrhea, abdominal pain, tenderness, rigidity or local thickening occur the process is already far advanced. It is now believed that its occurrence can be detected much earlier and that treatment promptly instituted and consistently followed up may result most happily.

There are several early symptoms which we now know should suggest intestinal involvement. One is failure to improve in spite of quiescence or improvement in the lung lesion. A stationary or retrogressive general condition for no apparent cause should make one watchful at once. If in addition the patient complains of slight persistent nausea, of anorexia and a feeling of discomfort after eating, one's suspicions should increase. Constipation and gaseous indigestion are said to be early symptoms. Webb and Gilbert,[1] and Stewart[2] speak of undue nervousness as often present in these cases. Stewart emphasizes the value of the combination of nervousness, anorexia and constipation as an aid in diagnosis.

A slight irregular rise of temperature, often normal, but sometimes 99.5 or more, may be present.

Abdominal examination in some instances reveals localized thickening, which may be accompanied by tenderness. This frequently does not occur until later in the disease.

Severe pain is not an early symptom. Cramps occur later in the disease and are sometimes relieved by fasting.

Diarrhea at first transient and later severe and continuous is usually present in advanced cases, but may be due to other causes than tuberculous enteritis.

*Read before the St. Louis County Medical Society, Duluth, September 10, 1925.

The finding of tubercle bacilli in the stools is of no value, as they are usually present in the feces of patients who have positive sputum. The occurrence of either pus or blood in the stools is common in the later stages of enteritis, but both may be lacking.

Walsh,[3] in 1909, as the result of clinical and post-mortem studies at the Phipps institute, concluded that the diagnosis of intestinal tuberculosis could not be made with any degree of certainty from symptoms. That was before the use of *x*-ray methods.

While the earlier symptoms just mentioned may all be absent in proven cases of tuberculous enteritis and may be present in other conditions, their value as strongly suggesting the diagnosis has now been established by their occurrence in connection with positive *x*-ray findings. In fact, our greatest aid in the diagnosis of early intestinal tuberculosis is *x*-ray examination of the passage of a barium meal through the alimentary tract.

The appearances characteristic of intestinal tuberculosis were first noted by Stierlin[4] of Basel. He found that in cases of stricture of the lower end of the ileum as well as of induration and ulceration of the wall of the cecum and ascending colon the intestinal contents pass so rapidly through the inflamed areas that demonstrable filling defects become easily recognizable. In all of the seven cases he reported in 1911 the diagnosis was confirmed by operation.

Archibald and Pirie[5] of Montreal seem to have discovered "Stierlin's phenomenon" independently. Dr. Pirie, roentgenologist of the Royal Victoria Hospital, reported in 1917 his observations made in 1914 as follows:

"Dr. Archibald has asked me if I could write from memory a summary of my findings in tuberculous conditions of the intestines. I do so with pleasure, as it was the most interesting work I did for about a year before the war began. Writing as I do without notes from a base hospital in France, I well remember the disappointment we had, as in several successive cases of tuberculous cecum I failed absolutely to help in the diagnosis. Some bad luck seemed to dog my steps, for whereas we had formerly been able to show by means of a barium meal the position, shape and size of the normal cecum, yet we failed, in these tuberculous cases, to catch the cecum at the proper time when it was filled by the meal. Finally, the cause of our failure struck us. We could not show the cecum filled by a barium meal because it never did fill when tuberculous ulceration existed. Setting out with this as a working hypothesis, we examined the cases at half-hour intervals from four to twelve hours after the barium meal. We found our theory correct in each case of tuberculous cecum, namely, the cecum never filled up with the meal. Each small squirt of barium that left the ileum was quickly passed on past the cecum and collected elsewhere in the large colon, either in the transverse or the descending part. So that our conclusion was, that in a tuberculous subject with symptoms suggesting tuberculous cecum, if the cecum did not fill from four to twelve hours after the barium meal when examined at intervals of about half an hour, then this want of filling confirmed the diagnosis. On the other hand, when it did fill as it does in a normal individual, it negatives the diagnosis of tuberculous cecum. We had this latter experience confirmed in one case where a clinical diagnosis of tuberculous cecum had been suggested; the *x*-ray showed a cecum filled by barium, and at operation a non-tuberculous cecum was found."

In 1919, Brown and Sampson[6] of Saranac Lake reported the examination of 110 cases by this method. They held that an *x*-ray examination in a patient with pulmonary tuberculosis which showed hypermotility, spasm or filling defects should lead to a definite diagnosis of colonic tuberculosis. According to these investigators conditions other than ulceration of the cecum or ascending colon do not produce this rapid type of hypermotility with its peculiar attending features. Cases of acute or habitual diarrhea did not show it nor was it found after catharsis. From a study of the prints of Imboden and Spriggs they believed it was possible to exclude definitely disease of the appendix as a cause.

Carman[7] of Rochester, Minnesota, states that absence of the barium shadow may be found in ulcerative carcinoma and in chronic ulcerative colitis, but tuberculosis has such a predilection for the ileocecal coil that a lesion in this part of the intestine associated with pulmonary tuberculosis is most likely tuberculous. The local acceleration and gap in the barium shadow he believes does not represent true hypermotility due to increased peristalsis, but is the effect of diffuse infiltration of the bowel wall producing ragidity. The physiological functions of the diseased segment of the colon being lost, the barium passes through without hindrance just as it does through a stomach diffusely infiltrated with cancer. Carman believes that the roentgen ray furnishes the most certain means yet available for the diagnosis of intestinal tuberculosis.

Paterson[8] of Saranac Lake cites twenty-two cases confirmed by operation and considers *x*-ray study to be of great help in the diagnosis of tuberculosis of the cecum and large bowel, of at least as much

help as the *x*-ray examination of pulmonary cases.

Pritchard[9] and Stewart[2] both endorse the method, the latter reporting 1,100 *x*-ray studies of 900 patients at the Manitoba Sanatorium.

On the other hand, Schwatt and Steinbach,[10] after checking up an unspecified number of cases with autopsy findings, have not been uniformly convinced as to the alleged great value of this method of diagnosis.

Webb and Gilbert,[1] while acknowledging that an *x*-ray examination has been of great assistance in the diagnosis of early cases of intestinal involvement, warn against too great reliance on negative findings, as they believe the *x*-ray may fail to detect the earliest phases of tuberculosis, especially when confined to the small intestine. They believe that the diagnosis can in most cases be made without the *x*-ray from a careful consideration of digestive complaints and that the fatigue incident to the examination may occasionally do harm.

The technic of the examination is not difficult. In the Mayo Clinic[7] the enema is ordinarily employed, though the ingested meal is also used. Archibald and Pirie, the pioneers in this work in America, used the ingested meal ordinarily and the enema only occasionally. Brown and Sampson, Paterson, Stewart and others who have used the *x*-ray examinations prefer the barium meal by the mouth to the enema.

In our series the enema was not used. Our technic, which is practically the same as that employed by Stewart at the Manitoba Sanatorium, consists in giving 4 oz. of a specially prepared barium meal with the routine breakfast at 7 A. M., after which no food or water is taken until 6 P. M. The patient is examined with the fluoroscope five hours after the ingestion of the meal and if it is considered necessary a plate is taken. Routinely, plates are taken at nine, eleven, and at twenty-five hours. This procedure is more satisfactory than the observation of the patient after only two to five hours and again after six to eight hours. It will be seen then that the examination cannot very well be made in a physician's office or the general hospital unless arrangements are made for *x*-ray service at the proper hours. The examination of the nine and eleven hour plates gives the most valuable information. All medications, especially cathartics, are discontinued for at least three days before the examination.

The normal stomach empties itself in from three to five hours. The head of the barium meal reaches the ileocecal valve in from one to three hours. The ileum empties itself in from two to four hours after the ingestion of a meal. Six hours after taking the meal the head of the column is seen at the hepatic flexure or splenic flexure. Complete evacuation of the meal takes place in about thirty-six to forty-eight hours. The cecum remains well or partially filled from the fourth to the thirty-sixth hour.

In cases of tuberculous enteritis the barium usually passes through the large bowel with great rapidity. Often complete evacuation has occurred within twenty-four hours. The cecum and lower part of the colon seem to pass along the material as rapidly as it is received. The usual haustral sacculations are lacking. The affected portions are only partially filled and have a distinctly ragged and irregular appearance. Instead of the evenly filled cecum and colon with the sharp clear-cut outline and normal haustral markings, the ulcerated area presents an irregular outline with somewhat fuzzy edges and narrowing of the diameter of the shadow. Occasionally, the barium meal seems to be delayed at the ileocecal valve, possibly by spasm (ileal stasis), but once in the colon to be hurried through it in the manner described. Occasionally, the outline of the cecum is smooth, but lacks haustral markings and the whole cecum is uniformly narrowed. The three pictures, hypermotility, filling defects and ileal stasis, are said to be especially characteristic of ulceration of the cecum and ascending colon. Spasm of the musculature of the colon is also suggestive.

In this series of seventy-three cases examined all but four had pulmonary tuberculosis. Thirty-nine had far advanced disease in the lung; twenty-nine had moderately advanced pulmonary trouble and four had no pulmonary involvement. Of the thirty-nine cases with far advanced pulmonary disease, thirty-one showed positive *x*-ray evidence of intestinal disease, while of the twenty-nine moderately advanced cases only twelve showed such evidence. None of the four cases not having disease in the lungs gave *x*-ray evidence of intestinal tuberculosis.

The average duration of the pulmonary disease in the positive cases was less than a year in twenty-three cases and more than a year in twenty-one. In the negative cases the duration of the pulmonary

disease was less than a year in twelve and more than a year in twenty-nine.

The x-ray evidence of disease consisted of hypermotility in forty-four cases and filling defects in forty-four. One case without symptoms showed hypermotility and one a filling defect. Seven cases diagnosed as tuberculous enteritis showed gastric retention, as did four considered as not having an intestinal complication.

The occurrence of symptoms in those showing x-ray evidence of intestinal tuberculosis and in the negative cases is indicated in the following table:

SYMPTOMS OF TUBERCULOUS ENTERITIS

Symptom	X-ray Positive	Per-centage	X-ray Negative	Per-centage
Pulmonary lesion	44	100	24	83
Not doing well	28	64	13	45
Nervousness	11	25	3	10
Anorexia	34	77	10	34
Abdominal discomfort	31	70	9	30
Flatulence	17	39	2	17
Pain	18	41	10	34
Vomiting	8	18	2	7
Constipation	21	48	14	48
Diarrhea	18	41	6	20

As regards results of treatment, as our series of examinations was begun only about six months ago it is early to expect definite x-ray evidence of healing. Of the forty-four patients examined eighteen are symptomatically unimproved; sixteen are improved and ten are dead. Paterson reports that some of his patients who have given positive x-ray pictures lost their symptoms and later failed to show any x-ray evidence of disease. That tuberculous ulcers may heal is indicated from the post-mortem studies of Schwatt and Steinbach.

Our resources in the treatment of intestinal tuberculosis include rest, diet, heliotherapy, medicines and surgical measures. The exclusion of the diseased area by surgical means or its total excision has been successfully accomplished in some cases. Paterson reports twenty-two cases operated upon with improvement in ten cases. It is, however, impossible to determine the extent of involvement and all such operations must be considered as exploratory. The prognosis is bad in advanced cases, as these are usually accompanied by extensive pulmonary disease. If the diagnosis can be made sufficiently early it is probable that as good results can be obtained by the adoption of hygienic and other measures not as radical as the surgical procedures. The routine x-ray examination with the barium meal of every case of pulmonary tuberculosis with prompt treatment by rest, diet, and heliotherapy of all positive cases would, we are convinced, result in the arrest and eventual healing of the tuberculous intestine in many early cases. In certain more advanced cases in good general condition surgical treatment may be indicated.

IN CONCLUSION

With the aid of the x-ray it is possible to diagnose tuberculous ulceration of the colon near the cecum, which is commonly one of the first sites of tuberculosis of the intestines, much earlier than formerly.

Every patient with pulmonary tuberculosis should be given a barium test meal or enema in order to determine the presence of Stierlin's phenomenon.

The prognosis of tuberculous enteritis in the early stages is not absolutely unfavorable and satisfactory results may be anticipated from the use of hygienic measures, and heliotherapy. In certain special cases surgical intervention may be desirable.

CASE REPORTS

Case 1.—J. H., farmer, age 22, admitted July, 1924. Pulmonary disease far advanced. Pulmonary symptoms were never severe, but at no time has he done well. Much under-weight and loss of strength. In February, 1925, began to have an elevation of temperature. Complained of indefinite abdominal pains and intestinal flatulence. Has continued to lose weight.

X-ray plates showed hypermotility with filling defects of the cecum and ascending colon. Has had more rigid rest treatment and diet control and has been given lamp and sun treatment with drugs to control intestinal hypermotility and cramps.

Case 2.—G. R., laborer, age 47, admitted June, 1923. Pulmonary classification—far advanced.

Pulmonary symptoms were slight and he carried on very comfortably till January, 1925, when he began to have an elevated temperature and lose weight continually. Pulmonary symptoms were not increased and x-ray plates did not show any increase of disease. No abdominal discomfort was complained of till June, 1925, when he had loss of appetite, slight abdominal pain and intestinal flatulence. Appetite became progressively worse, pain increased, temperature remained elevated and weight decreased. Symptoms were relieved by giving barium.

X-ray plates showed the small bowel empty at nine hours, cecum irregular and contracted and never well outlined.

Case 3.—A. S., age 20, laborer. Admitted August, 1925. He had been diagnosed as having tuberculosis six months earlier, but continued to work till admission. Pulmonary

condition very far advanced. Had some abdominal symptoms on admission consisting of anorexia and slight discomfort after meals, but symptoms were not severe enough to be complained of.

X-ray examination shows hypermotility with poor filling of the cecum and ascending colon.

Case 4.—R. K., painter, age 46. Entered Nopeming July 23, 1925. Pulmonary symptoms were very slight, though he had far advanced disease. Had a double orchitis with discharging sinuses. Sputum positive. Was under weight and ran a normal temperature till early in July, when his temperature became irregularly elevated with no increase in pulmonary symptoms. Began to lose weight rapidly. Appetite was fairly good, though he had a sensation of fullness in the abdomen and loss of appetite. Vomited at times and had a good deal of intestinal flatulence with rumbling in the abdomen. Began to have attacks of pain in the abdomen, slight and not very troublesome, relieved by taking paregoric. Bowels were constipated, but later had some diarrhea.

X-ray plates show hypermotility of the large bowel with the cecum poorly filled in all plates taken.

Case 5.—A. A., age 23, carpenter. Admitted November, 1923. Pulmonary condition far advanced. At no time since admission had he done well. Pulmonary symptoms troublesome and in July, 1924, he began to have anorexia and pain, but no bowel irregularity. Gained weight for a few weeks after admission, but later began to lose. In February, 1925, began to have increased abdominal discomfort and diarrhea which more or less persisted till the time of his death following hemoptysis in April, 1925.

X-ray plates showed marked filling defects of cecum, ascending and part of the transverse colon.

Case 6.—O. A., towerman on railway, age 26. Admitted July, 1924, with far advanced disease. Pulmonary symptoms severe. Underweight and loss of strength marked. Began to have abdominal symptoms in November, 1924. Appetite poor. Gastric distress and bowels irregular and later some diarrhea. Continued to lose weight and strength. Diarrhea became troublesome in February, 1925, and was accompanied by considerable abdominal pain. Condition became progressively worse till death in March, 1925. *X*-ray plates showed a gastric retention at eleven hours and a small bowel segmentation. Barium had not entered the cecum at eleven hours. Once inside the large bowel it was soon expelled.

Diagnosis of both tuberculous enteritis and colitis was made and verified at autopsy.

REFERENCES

1. Webb, G. B., and Gilbert, G. B.: Tuberculous enteritis, the dietetic management. Tr. Nat. Tuberc. Assn., 1924, xx, 121.
2. Stewart, D. A.: Tuberculosis of the intestines. Can. Med. Assn. Jour., 1923, xiii, 20.
3. Walsh, J.: Diagnosis of intestinal tuberculosis. Tr. Nat. Tuberc. Assn., 1909, v, 217.
4. Stierlin: Die Radiographic in der Diagnostik der Ileozoekal Tuberkulose, Munchen. med. Wchnschr., 1911, lviii.
5. Archibald, E.: The rôle of surgery in the treatment of intestinal tuberculosis. Am. Rev. Tuberc., 1917, i, 449.
6. Brown, L., and Sampson, H. L.: The early roentgen diagnosis of ulcerative tuberculous colitis. Am. Rev. Tuberc., 1920, iii, 698.
7. Carman, R. D.: The roentgen diagnosis of diseases of the alimentary canal. Second Edition, Philadelphia, 1921, 562.
8. Paterson, R. C.: Intestinal tuberculosis. Am. Rev. Tuberc., 1920, iv, 433.
9. Pritchard, J. E.: Tuberculous ulceration of the intestines. Can. Med. Assn. Jour., 1924, xiv, 5.
10. Schwatt, H., and Steinbach, M. M.: Tuberculosis of the intestines. Am. Rev. Tuberc., 1923, viii, 9.

What force is it that has induced more than three hundred of the most representative citizens of Minneapolis to leave their own firesides and to forego all other engagements that they might foregather here this evening? Was it the fact that a certain man has lived for many years in our midst and has devoted himself throughout this period to a life of public service? I do not believe so. Was it the fact that this man in the course of his lifetime has accumulated a large fortune? I do not believe so. Was it the fact that he gave a considerable share of this fortune to provide for the relief and care of crippled children? I do not believe that this is the reason why we are here.

But the real reason is far deeper, far more fundamental, far more universal than any of these. We are here to pay honor and tribute to one who has found the magic alembic for which the ancients sought, the philosopher's stone which transmutes the baser metals of the world into fine gold. He has used this stone to transmute the gross material wealth of the world into the social gold of spiritual values. He gave his money to the schools and to the University to be used perpetually for the education and relief of physically handicapped children. How fine it was that he sensed the profound truth that education makes for culture, health for happiness, both for progress; and that wealth in and of itself, unless used to promote human welfare, is dross. The true values of life are measured by its intangibles, *i.e.*, by its ideals put to work. That modern business man who wins wealth and turns it to social uses, who directs it so that it adds to human happiness, is the long sought and greatly to be cherished philosopher's stone that transforms material possessions into spiritual returns.

It is this that Mr. Eustis has done. It is for this reason that we are here. Mr. Eustis gave and he gave as Dr. Folwell would say, "Like a prince." One of the fine things said about Columbus was that "an instinct of a continent stirred within him." And so it was with Mr. Eustis in the provision he made for his gift. The money gathered by one man will now be used for the benefit of hundreds and thousands of children year after year, decade after decade, generation after generation. The ancient alchemists sought a grand elixir which was to confer immortal youth upon the person who was brave enough to kiss and quaff the golden draught. Mr. Eustis has indeed gained immortal youth because his life's treasures will go on forever and ever ministering to youth.—Dr. Lotus D. Coffman, Minnesota Chats, Nov., 1925.

PULMONARY CIRCULATION*

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Gentlemen: When asked to speak to you on the physiology of respiration I thought it would be best to confine myself to one aspect of this subject and have chosen the pulmonary circulation. This subject probably presents more difficulties than almost any other one in the physiology of the circulation and respiration. However, some general considerations may help us.

The first point to bear in mind is that practically the same amount of blood must pass through the lungs in any given time as passes through all the other organs of the body. Likewise, the amount of blood going to these organs is dependent on the amount of venous blood going to the right heart. One of the most important advances made in regard to the physiology of muscle is that its power increases as the muscle fibers lengthen and vice versa. We have here a very effective mechanism for taking care of an altered inflow into the heart. Starling[1] and his workers have shown that the heart can pump out much more blood merely by increasing the rate of inflow into the right auricle. In Starling's experiments there was no change in the rate of the heart, the increased amount being due to increased output per beat, because increased inflow causes the muscle fiber to lengthen out. Likewise great increase of arterial pressures may be overcome inside of two or three beats by the same mechanism.

Most observers have found an increase of only three to five times in the blood flow through active voluntary muscle as a result of activity, although Krogh's[2] results show that at rest only about one per cent of the total capillaries may be open. According to most observers the increase of visible capillaries in voluntary muscle is brought about by what is termed an axone reflex working directly on the capillaries. Bayliss rendered it very probable that most sensory fibers bifurcate near their termination, one branch going to the sense organ, and the other branch going to the blood vessel. This view has been substantiated by the work of Bruce and others on inflammation. This mechanism is set into action by activity of the part and is a very nice mechanism, as it insures a plentiful blood supply to an active organ. According to Krogh, this axone reflex mechanism works on the capillaries and not on the arterioles. Krogh found this mechanism many places in the body, but, so far as I know, the lungs have not been investigated.

It is certain, however, that the vessels of the lungs can readily accommodate much more blood than is ordinarily present in them, and the first point we may consider is the maximum capacity of the pulmonary circulation. Probably the best way to get the maximum capacity of the pulmonary circulation would be to get the maximum capacity of the right ventricle and multiply that by the maximum number of beats in a given time. In 1864, Heffelsheim determined the ventricular capacity in three adult males to be 143, 158 and 168 c.c. Recently, Periot[3] found from 100 to 160 c.c. It is probable the ventricle does not quite completely empty itself at every beat, so if we take 150 c.c. as the maximum output, and 160 as the maximum rate, the maximum output could be almost 24 liters per minute. It is interesting to note that Krogh and Lindhard[4] got outputs as high as 21.6 liters in severe exercise and as small as 2.8 liters during rest. This is an increase of about eight times. It is also interesting to note that Collett and Liljestrand[5] found it took from 30 to 45 minutes of rest before the resting volume is obtained. Krogh and Lindhard's method is a difficult method, but is probably, in the hands of good workers, better than the *x*-ray method of following the size of the heart. This latter method has, however, brought out the fact that if the heart is accelerated enough there may be no increase in size in exercise.

We may arrive at similar figures from oxygen use. Severe exercise may increase the heat production about ten times. In severe exercise Hill has shown there is an oxygen lack which lasts for some time. Hill[6] and his workers showed that if the exercise be moderate the respiratory quotient does not change, but if exercise is severe the respiratory quotient may go nearly to 2. This is due to the increase of lactic acid in the blood which reduces the alkali reserve and frees CO_2. Thus, one of Hill's subjects, lying down, produced 181 c.c. CO_2 and used 217 c.c. O_2 per minute, giving a respiratory quotient of .83. Now in stationary

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Read by invitation before the Medical Staff of the Lymanhurst School for Tuberculous Children, September 22, 1925.

running, 276 steps per minute for two minutes, the same subject produced 3,080 c.c. CO_2 and used 2,400 c.c. O_2 per minute (a respiratory quotient of 1.29), taking into his lungs 72 liters of air per minute. This is an increase of 17 times in the production of CO_2 and a little over 11 times in oxygen intake.

All of these facts show the lungs are built to withstand very severe calls on them and that the circulation must accommodate itself. This fact was believed proven by the experiments of Lichtheim,[7] who showed that one pulmonary artery and about half the branches of the other artery could be put out of action without a fall of arterial pressure. This, of course, meant that the blood which ordinarily goes through both lungs can be accommodated by one-fourth of the pulmonary circulatory capacity. This question was investigated by Kuno[8] on a heart-lung preparation and he found that if the inflow into the heart was not excessive, ligature of one pulmonary artery had no effect on arterial pressure or output; but if the circulation was increased, then a decrease in arterial pressure and output resulted. It should be mentioned that two observers, Langraf[9] in 1890, and recently Burton Opitz,[10] found compression of even a small branch of a pulmonary artery caused a drop in arterial pressure. The only explanation I can see for their results is that either they had an excessive circulation or else they caused a reflex vaso-dilation —the depressor action. Dilation of the base of these large arteries is supposed to stimulate the ends of the depressor fibers and tend to relieve the high pressure by a vaso-dilation. It might be that their clamps stimulated this mechanism. It is interesting to note that McDowall[11] has described the opposite effect from the base of the great veins. When the venous pressure is low, section of the vagi causes a fall of arterial pressure, tending to show that impulses from the great veins were tending to keep up arterial pressure—a pressor effect.

Another much disputed point is the presence or absence of vaso-motor nerves to the lung vessels. I have not been able to find much reported about the minuter structure of the smaller pulmonary arteries and arterioles where one would expect vaso-motor nerves to have much effect. However, one general consideration must not be forgotten. As pointed out before, the amount of blood to the lungs is regulated by the amount the right heart receives. All vaso-motor nerves could do would be to shift blood from one lobule to another. The question of whether there are such vaso-motor nerves has been reviewed recently by Wiggers[12] and by Schafer,[13] and they believe the evidence is probably in favor of such nerves. Of course, if these nerves all caused contraction of the arterioles, at once the effect would be felt on the right heart and venous pressure rise. Schafer's work would seem to indicate they act independently of the vaso-constrictors to other organs.

Another extremely important point is what the expansion of the lungs in inspiration does to the blood vessels. Do the lung vessels hold more blood during inspiration than during expiration? What does collapse of the lungs do to the flow of blood through it? This problem has been attacked in a number of ways.

First, effort has been made to ligate the lungs at the end of inspiration and at the end of expiration. This method is not very satisfactory because of the difficulty of adjusting ligatures, etc., and keeping the pressure conditions normal. In large rabbits, Heger and Spehl[14] found very little difference between the inspiratory and expiratory position and this has been the prevalent idea. However, by other methods, investigators have differed. These differences have come chiefly from perfusion experiments. In some of these the lung has been under negative pressure and as this negative pressure has been increased, more blood would naturally go into the lung in this condition. These individuals, forgetting the pressure conditions, have concluded that inspiration expands the blood vessels of the lungs. However, this is probably not correct. Those people who have kept the pressure conditions correct have not found increase of blood in the lungs[15] during inspiration. What inspiration seems to do is to lengthen out the capillaries and thus reduce the bore. Cloetta's[16] measurements of the capillaries of lungs fixed in inspiration and expiration are very definite. The capillaries have a much smaller bore in inspiration. The total volume of the capillaries would not be much altered. In the literature one frequently finds experiments criticized because people used artificial respiration. Now, a little consideration will show that it will make no difference whether one uses artificial or natural respiration. In natural respiration the high pressure is inside the lungs (intrapulmonic) and the low pressure outside (intrathoracic). The pressure to which the lung

vessels are subjected is the difference between these two pressures, probably 3-8 mm. Hg. ordinarily. Now in artificial respiration the larger pressure is again inside and the low pressure outside, and the difference between them is the same for the same expansion of the lung as in natural respiration.[17] We may thus conclude that the degree of inflation of the lung will not have much effect on the total amount of blood in it, but will affect the ease with which blood will flow through the lungs, the narrowing of the capillaries in inspiration tending to hinder the flow of blood if everything else remained constant. However, in the normal animal, other things tend to overcome the effect of this narrowed capillary bed. The narrowing of the capillaries should tend to cause a fall of arterial pressure because of the increased resistance in the capillaries, but this effect is masked and completely overcome by the increased output of the right ventricle. The decrease of intrathoracic pressure caused by the enlargement of the thorax naturally causes an increased flow of venous blood to the heart and the right heart responds by an increased output. This increased output will be forced through the narrowed capillaries of the lungs and inspiration tends to raise arterial blood pressure. However, experiments have shown that these effects are not instantaneous. If one alters the venous inflow into the right heart by such an experiment as clamping the superior or inferior vena cava, one finds that there is no change in arterial blood pressure for about three beats. The same thing happens when the inflow into the right heart is increased. There is no change in the arterial pressure for three heart beats. Thus the reason there has been so much discrepancy as to the effect of inspiration and expiration on arterial pressure is due to the neglect of this latency.[17] Everyone who has investigated has found a better venous inflow into the right heart as a result of inspiration. Now where this increased amount of blood will show up on arterial pressure depends on the heart respiration ratio. If one had a ratio of 6 to 1, the true effect of inspiration will show up in expiration and vice versa. This better filling of the right side of the heart and its increased output would probably account for the slightly more blood found by some observers in the lungs in inspiration and expiration.

Löhr[18] has recently made an extended series of experiments on the circulation through the lungs by perfusion. In these experiments the mistake is made that the perfusion pressure represented by the contraction of a rubber ball is kept constant while the pressure is varied in the lung. Naturally he finds an increased blood flow through the lungs when the pressure there is decreased. He also observed a markedly decreased flow through the lungs when they were compressed by pressure from outside, but I hardly think that Löhr's results can be applied to the living body as in collapse of one lung, although it stands to reason if you have increased pressure in one pleural cavity, more blood would tend to go to the other pleural cavity.

Wiggers[19] and Schafer[20] have measured the pressure in the pulmonary artery, and both say inspiration causes a fall of pulmonary pressure, and interpret this as indicating larger vessels in inspiration. The tracings show a fall at first followed by a rise. The rise, I think, is the true effect of inspiration. However, there probably is a position of the lungs where the blood will go through the capillaries most readily. The expansion of the alveoli might straighten as well as narrow the capillaries. However, everything shows that the blood passes through the lungs readily in all conditions.

I may next take up the question of the amount of blood in the lungs. This must be a varying quantity. Heger and Spehl give one-twelfth to one-thirteenth of the blood on inspiration and one-fifteenth to one-eighteenth on expiration: that is, from 7 to 9 per cent. However, these figures must vary and in times of accelerated circulation there must be more. Kuno,[21] with a heart-lung preparation, observed the amount increased markedly when the rate of inflow increased. With a small inflow he observed 8.8 per cent of the total blood was in the lungs, but when the flow was increased about three times, the amount in the lungs increased to over 19 per cent. If the lungs became edematous, he found over 25 per cent in the lungs. Figures resembling these high ones of Kuno have also been observed by Stewart.[22] Stewart based his findings on the following considerations. The minute volume of the heart must equal the volume of blood in the lungs multiplied by the circulation time through the lungs. If any two of these factors be known the third might be calculated. Stewart calculated the circulation time and the output and found from 11 to 26 per cent of the blood in the lungs. When the aorta was blocked, the inflow into the right heart being unobstructed, the lungs

were found in one animal to contain about 22 per cent of the total blood and the heart and lungs in two other animals 27 and 30 per cent. It may be mentioned that Kuno found in dogs the circulation time in the lungs in a heart-lung preparation to vary from 1.3 to 4.4 seconds. Stewart, in dogs, found the time from the right heart to the aorta to be from 1.7 to 8 seconds, and Romm[23] from 4 to 10 seconds.

The next question to consider is that of the normal pulmonary blood pressure. This has been investigated by a number of different workers. Starling and Führer[24] on their heart-lung preparation found that the pulmonary pressure rose with an increase of arterial pressure. Likewise, an increase of venous inflow into the heart tends to increase the pulmonary pressures, but only within what might be termed physiological limits. One must not forget the pericardium. This is made of fibrous tissue and therefore inextensible. Kuno[25] has shown that opening the pericardium causes a fall of venous pressure, a rise of arterial pressure and an increased output of the heart. Now if the pericardium is removed, the heart tends to overdistend and hemorrhages occur into its tissue. Because of its thin wall this affects much more the right side than the left. With the pericardium closed. Kuno observed that increased venous pressure always led to an increased pulmonary pressure, increased pressure in the left ventricle and increased output of the heart. However, if the pericardium be opened when the inflow becomes too great, an increase of venous pressure leads to a fall of pulmonary pressure and fall of left auricular pressure, and a decreased output of the heart. This means the right side of the heart is stretched beyond its physiological limits. It is obvious that the more rapid the heart beat, the less time for diastolic filling and therefore less time for overdilation of the heart and less use for the pericardium.

Another very important point is the relation between pulmonary pressure and systemic pressure. Most observers find pulmonary pressure to be between one-fifth and one-sixth that of the systemic arterial pressure. Here we find a difference between those who have worked with the heart-lung preparation and those who have worked with the whole animal.[26] Those who have used the whole animal have found little relation between the two. A rise of systemic pressure does not produce any change in the pulmonary pressure because of the increased efficiency of the left ventricle due to the lengthening of the muscle fibers. However, those who used the heart-lung preparation find that the rise of systemic pressure produces a rise in pulmonary pressure. This is not due to a back pressure effect, because a rise of systemic pressure does not cause a rise of pressure in the left auricle. The cause is due to increased coronary flow. Starling and his workers[27] showed that a rise of arterial pressure increased the flow through the coronaries. As much as one-third of the total output of the left ventricle may go through the coronaries with a very high aortic pressure. A rise of systemic pressure will thus result in an increased filling of the right ventricle, which will respond by increased output and a consequent rise of pulmonary pressure. This question needs reinvestigation on the whole animal.

An extremely important problem is the effect of various drugs on the vessels of the lungs. This has given rise to a great deal of work with varying results. We will first consider CO_2. Starling and Führer[24] observed in the heart-lung preparation when the arterial resistance is kept constant that asphyxia caused a very gradual drop of arterial pressure and then a sudden drop. The pulmonary pressure rises slowly and then suddenly. These results are to be explained on the loss of efficiency of the left ventricle. It gradually loses its ability to contract against this pressure. Löhr[18] studied the effect of gases by means of perfusion and observed CO_2 led to a constriction of the lung vessels. If adrenalin be added to the blood in place of constriction one gets a dilation. The most prevalent idea of the action of CO_2 on vessels is that its action is due to changes in H ion concentration. Increase of H ion concentration usually causes dilation, and decrease, a contraction of vessels. Löhr observed a remarkable effect of CO_2 on the muscles of the bronchi. In concentrations up to about 30 per cent, CO_2 dilated the bronchi, but above that per cent, caused a constriction of them. The percentage of O_2 breathed seems to have little effect on the pulmonary vessels. Chloroform and ether seem to cause a dilation of the vessels, but in large concentrations cause a constriction of the bronchial muscles. Nitrous oxide and ethyl chloride seem to dilate the pulmonary vessels without having much effect on the bronchi.

The action of adrenalin has been studied a great

deal with contradictory results. Löhr says that using the same sample of adrenalin, and under apparently similar conditions, sometimes constriction and sometimes dilation occurs.

Caffein, theobromin, papaverin, atropin and amyl nitrite, according to Löhr, cause the vessels to dilate and also the bronchi.

Before concluding, I wish to remind you of the bronchial circulation. Branches of intercostal arteries accompany the bronchi. It has been shown that part of this blood returns by the pulmonary vessels, but most is returned by the bronchial veins. It must be to this circulation and not to the so-called pulmonary circulation that we must look in repair of lesions affecting the larger tubes. Likewise, the question of lymphatics is of extreme importance. According to Miller,[28] we have lymphatics in the pleura and accompanying the bronchi, pulmonary artery and pulmonary vein, but there are no lymphatics around the pulmonary capillaries. In other words, one might say the lymphatics were bronchial rather than pulmonary. I will only remind you that an edema may be due just as much to a decreased flow away from the part as to increased production of fluid. In other parts of the body we have examples of each kind.

BIBLIOGRAPHY

1. Starling, E. H., and Knowlton, F. P.: Jour. Physiol., 1912, xliv, 206, and numerous papers in Jour. Physiol. since.
2. Krogh, A.: Jour. Physiol., lii, liii, lv. Also Anatomy and Physiology of the Capillaries, 1922, Yale Univ. Press.
3. Periot, M.: Comp. Rend. Soc. de Biol., 1925, xcii, 615.
4. Krogh, A., and Lindhard, J.: Skan. Arch. f. Physiol., 1912, xxvii, 100.
5. Collett and Liljestrand: Skan. Arch. f. Physiol., 1924, xlv, 17.
6. Hill, A. V., Long, C. N., and Lupton, H.: Proc. Roy. Soc. London B., 1924, xcvi, 438.
7. Lichtheim, L.: See Tigerstedt Ergeb. d. Physiol., ii, 1903. This review contains the older literature on pulmonary circulation.
8. Kuno, Y.: Jour. Physiol., 1915, l, 140.
9. Langraf: Centr. f. Physiol., 1890.
10. Burton-Opitz, R.: Am. Jour. Physiol., 1921, lviii, 226.
11. McDowall, R. J. S.: Jour. Physiol., 1924, lix, 41.
12. Wiggers, C. J.: Physiol. Reviews, 1921, i, 139.
13. Schafer, E.: Arch. Inter. de Physiol., 1922, xviii, 14.
14. Heger and Spehl: Arch. d. Biol., 1881, ii, 153.
15. Bowditch and Garland: Jour. Physiol., 1880, ii, 91.
16. Cloetta, M.: Arch. Exp. Path. U. Phar., 1911, lxvi, and 1912, lxx.
17. Visscher, M. B., Rupp, A., and Scott, F. H.: Am. Jour Physiol., 1924, lxx, 586.
18. Löhr, H.: Zeit. Ges. Exp. Med., 1924, xxix, 67.
19. Wiggers, C. J.: Am. Jour. Physiol., xxx, xxxiii.
20. Schafer, E.: Quart. Jour. Exp. Physiol., 1919, xii, 394.
21. Kuno, Y.: Jour. Physiol., 1917, li, 154.
22. Stewart, G. N.: Am. Jour Physiol., 1921, lviii, 20.
23. Romm, S. O.: Arch. Ges. Physiol., 1924, cciii, 113.
24. Starling and Fühner: Jour. Physiol., 1913, xlvii, 286.
25. Kuno, Y.: Jour. Physiol., 1916, l, 1.
26. Anrep, G., and Bulato, E.: Jour. Physiol., 1925, lx, 175.
27. Starling and Evans: Jour. Physiol., 1912, xlvi, and Starling and Markwalder: Jour. Physiol., 1913, xlvii, 275.
28. Miller, W. S.: Am. Rev. Tubercul., 1919, iii, 33.

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CHRONIC BACKACHE FROM AN ORTHOPEDIC STANDPOINT*

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The treatment of manifest disease of the spine, such as tuberculosis, typhoid, syphilis, osteoarthritis, neoplasms or gross trauma is fairly well understood, and need not be discussed, except insofar as it may play a very important part in curing and relieving some cases of seemingly "simple" backache.

In the treatment of chronic back pain and disability we succeed or fail as we appreciate the underlying causes, or can understand (or perhaps imagine) the mechanism leading up to the disordered function in the back.

These patients complain oftenest of pain in one or both sacro-iliac regions, the lumbar, or the lumbo-sacral regions. In my experience, the frequency occurs in the order given. Many patients will tell us that a dull lumbar ache existed for many months and was followed gradually by pains localized over one sacro-iliac area; or a lumbar pain after light trauma was followed some weeks later by pain in the gluteal area of the same side, and still later by posterior thigh pains; or pains in the mid-lumbar area gradually set in, unassociated with trauma, to be followed somewhat later by pain in one sacro-iliac area and still later by posterior thigh and leg pains and a chronic course. Tenderness in one or another painful area may be associated. Some give a history of repeated similar attacks of varying duration; others of the attacks beginning with a "sudden catch" in the lumbo-sacral or sacro-iliac areas; or the attacks may be associated with a sensation of slipping or of giving way. In many the pain is worse on movement, as in turning in bed, walking, lifting, stooping or suddenly rising from a lying or sitting posture. In some the pain is worse when quiet, and better when moving and walking; and in others the pain is more or less constant.

Examination of these backs may show surprisingly little. Often movement in the back and lower extremities is limited. In many this limitation is of flexion of the spine only, extension being free. In others all movement may be more or less limited. Flexion of the fully extended lower extremity at the hip is limited in many, and causes pain in the lower back or posterior parts of the thigh and leg. In some a strikingly flat back or lordosis in the lumbar and lumbo-sacral area may be noted; in others there is present as well a list of the body to one side or the other. These symptoms are undoubtedly the expression of muscle spasm which, after persisting, leads to structural changes and shortening in which other tissues take part.

Nearly two-thirds of the cases to come under my observation had posterior thigh and leg pain. This condition is often mistaken for sciatica. Much speculation exists as to its origin. That it is due to pressure or irritation of a nerve directly or reflexly, and that it is entirely muscular in origin, has been variously held. It has been my experience that these posterior thigh and leg pains occur nearly always in cases in which undoubted muscle spasm and contraction in the lower back and posterior thigh structures exist, strongly suggesting a relationship. The striking relief from pain sometimes obtained following measures directed against these muscle spasms and muscle contractions, as well as the development of these pains gradually or suddenly at varying intervals after a backache or a back injury, are very suggestive of such a cause.

Fixation of a painful joint by continued and sustained muscle action, is a matter of frequent observation; when this has long continued it results in more or less contraction of the muscle or muscle group. It can be presumed that the muscles act in an identical manner in guarding and fixing various injured and diseased areas. It is furthermore very probable that in many chronic cases the symptoms persist because of muscle shortening and contraction even after the original exciting lesion has healed. In most cases there is a distinct tendency to recovery sooner or later. Fatigue and chronic strain have a similar effect upon muscle tissue.

Helweg* has recently attributed these pains to a myopathy due to overwork in muscles by which fatigue products (lactic acid) produce organic changes within the muscle (myositis).

*Read before the Northern Minnesota Medical Association, Brainerd, Minnesota, August 24-25, 1925.

*Helweg, J.: Sciatica. Acta Medica Scandinavica, Copenhagen, Supplement X, 1925.

For some years past considerable study and attention has been given by French and American orthopedists, to the lumbo-sacral region, especially to its anomalies, the relationship of the fifth lumbar vertebra to the sacrum, and to the relation of the transverse processes of the fifth lumber vertebra to the lumbar nerve roots (especially the fifth) of the sacral plexus. Removal of the processes on one or both sides has brought a high percentage of reported cures.

The sacro-iliac joints have for many years played a prominent part in the discussion of low back disorders. Strains and subluxations were at first assumed to account for most of these cases. In recent years the pendulum has swung the other way. It would appear that these account for a comparatively small number of the many cases considered under this symptom complex. I have not satisfied myself that I have seen an undoubted case of sacro-iliac subluxation. It is, however, quite probable that this joint, along with other neighboring structures, is frequently subjected to strains from various causes.

It must not be overlooked that certain of these pains, generally bilateral, are distinctly neuritic in origin (spinal root) and associated with vertebral, cord and caudal lesions.

It is quite obvious, from what has been said, that our knowledge of this common disorder is anything but crystallized. That muscle dysfunction, with its tendency to involve successively related groups of muscles (kinetic units), plays an important part in the production of the clinical picture and its chronicity, appears at least plausible. Treatment based on the assumption of such dysfunction has resulted in some marked, and even spectacular, cures, and has given more or less relief to many. With a better understanding of the underlying causes of such muscular dysfunction we can hope to succeed oftener than we now do.

Many causes of this muscle dysfunction have been described, and, with some call on the imagination, many new causes may be suspected. I shall here mention some which to me have seemed to be definite factors in this type of cases.

1. Acute sprain of the lower back structures, especially of the lumbo-sacral joints; tears of muscle fibres or of portions of muscles; bruises of muscles or their periosteal attachment, or of bursæ, etc.

2. Chronic strains of the lower back structures due to postural abnormalities, occupational strains, static strains (flat foot, short leg, deformity in foot, ankle and knee). Abnormal gaits during recovery from disability in a lower extremity, etc., might properly be included under this heading, as productive of chronic strain.

3. Fatigue in the constitutionally weak, or in those recovering from wasting diseases or diseases exerting toxic effects on muscles, *i.e.*, hyperthyroidism, etc.

4. Acute infections in muscles (myositis) or their attachments, in joints, bursæ, etc.

5. Chronic inflammation of the vertebral articulations, muscles, facia, etc., dependent often on foci of infection elsewhere. This, as a cause, probably accounts for many cases which show repeated or recurring attacks. Brackett has drawn attention to the special predisposition of individuals to chronic back complaints who harbor old, previously injured or diseased spines. In these individuals there is a tendency to chronicity far and above that found in normal individuals. It is conceivable that strains or pressure forces resulting from anatomical abnormalities may likewise initiate or maintain such dysfunctions or cause symptoms by direct pressure on nerves.

The proper examination of these chronic back invalids is a necessary prerequisite to proper treatment. They should be examined stripped, and the examination must be general and painstaking, otherwise much valuable information will be unavailable. A careful and searching history is no less indispensable. *X*-ray examination, preferably stereoscopic, of the spine and pelvis, and a neurological examination of the lower extremities, at least, should not be omitted in the serious cases. Occasionally, rectal examination will disclose much. Much stress is laid on the point of maximum tenderness on deep pressure as a guide to the location of the offending lesion. This, while an important aid, like many other isolated findings, is not pathognomonic. The importance of thorough examination lies in that it enables us to distinguish purely traumatic from infection processes, and to set aside cases due to a progressive disease. Failure to so distinguish properly may lead to harmful temporizing, and therapy productive of great damage to the patient.

As has been stated, some of these cases wear along and generally recover without or despite

treatment. With treatment, however, that is as intelligent as our knowledge (or imagination) will permit, one can hope to benefit and relieve many of these chronic sufferers.

Treatment.—I have seen the simple alteration of shoes by Thomas heels cause immediate relief from the symptom complex of low back strain with aggravated muscle spasm in back and thighs and characteristic pains. The same is true of cases in which the length of the lower limbs were equalized. Whenever static or postural abnormalities are noted in these patients, these abnormalities should be corrected as an aid to whatever other treatment may seem indicated. Occasionally a higher or lower heel will afford relief. Individuals with large pendant abdomens are made more comfortable with a suitable corset support.

In the chronically weak back with fatigue, due to muscle weakness from systemic causes, treatment should be directed to improvement of the general condition. Periods of rest during the day, coupled with some simple exercises and other physiotherapeutic measures are often helpful.

Rest in one form or another is an important ally in the treatment of many of these conditions. A firm bed will afford more rest to diseased or injured back structures than will a more yielding one. Plaster jackets, adhesive strapping, etc., afford forms of temporary rest which allow the patient to be about. A simple, narrow belt at times will produce freedom from symptoms, especially when placed low so as to grasp the gluteal muscles and so fix and support them. Metal braces and supports of the type of the Knight brace or some modification afford a more suitable partial support and fixation, for a longer period. In general, such fixation is indicated in the arthritic or seriously traumatized joints. An excellent means of securing rest and relief for severe spastically contracted and shortened muscles is recumbency on a firm bed with Buck's extension on both legs, with from fifteen to thirty pounds weight maintained continuously for from two to four weeks or longer if necessary. This often relieves pain and stretches shortened and contracted muscles, and, I believe, will, in selected cases, hasten improvement and recovery.

Application of various forms of heat, moist, dry, radiant or diathermia, relieves pain and softens muscles. Such treatment followed by an increasingly vigorous massage of the affected muscles and tissues, preferably by a trained masseur, with special attention to painful and thickened areas, are useful therapeutic agents. Active and resistive exercises of obviously involved groups of muscles are likewise helpful.

These various agencies are directed mainly to muscles—to relieve their spasticity, to lengthen them, to favor their circulation and nutrition and to improve their strength and tone. Insofar as the muscles are the cause of the symptoms, one can hope for relief by these measures.

Some years ago I examined a large framed, muscular Serbian, who presented himself with typical history and symptoms of over a year's duration. I outlined for him a course of treatment and prescribed for him the belt which I fancied at that time. A year later he returned "just to shake hands" and to ask what I did to him, as he was cured before he got from my office to the street, and had remained well since. I admitted to him that I wished I knew. On several occasions I have had similar experiences and they are not generally considered unique. What happened? It is not probable that the man suddenly recovered from a vertebra which had been displaced for a year. I imagine rather that a slight adhesion had been broken or a contracted muscle lengthened by the manipulation incident to the examination. This has been aptly compared to an improvement in the going qualities of an old alarm clock after vigorous shaking. Forcibly stretching the posterior thigh and back structures—so-called straight leg raising—under general anesthesia, causes, at times, similar improvement, and is a definite aid in the treatment of carefully selected cases.

Individuals harboring definite or suspicious foci of infection should have them removed when possible. Even in an obviously traumatic case, such removal may terminate a chronic course.

I have had no experience with removal of vertebral transverse processes or arthrodesis of the sacro-iliac joint. As stated previously, many gratifying results by these surgical procedures have been reported in recent years. Because of the technical difficulties involved in excision of the fifth lumbar transverse process, and the present day difficulty in accurately differentiating the site and character of symptom-producing lesions, this operation has as yet only a limited field of application

and should not be generally advocated. Some years ago I had occasion to employ a bone graft to fix the fifth lumbar vertebra in a case of beginning spondylolisthesis, as recently advocated by Whitman in certain cases of chronic low back pain. For the seven or eight months that the case was followed, the result was satisfactory.*

In conclusion I would emphasize the importance of careful examination and the consideration of all probable factors in these cases. In this manner only can the most intelligent treatment be applied to the individual case. Filling those patients with salicylates or hustling them to the diathermy room is not sufficient. It is especially important to recognize the arthritic group and above all the early stages of tuberculous disease of the vertebræ. Rough manipulation of these will only aggravate their sufferings, or lessen their chances of ultimate recovery. Cases which might probably be relieved by manipulations should be given the benefit of at least fair trial. It is in these latter cases that our chiropractic brethren occasionally "put it over." That they fail often, or aggravate many cases by their manipulations, does not affect the advertising that comes to them from the occasional cure.

*Since the above was written this man was again seen. In the six years that have elapsed since operative treatment he has remained well.

GOITER PROPHYLAXIS

Warnings against the promiscuous use of iodin in the prophylaxis of goiter are being sounded. Kimball urges that in all cases of iodin treatment, doses should be considered in terms of milligrams. The maximum dosage for an adult, provided there are no contraindications, is 10 mg. daily for not longer than one month, during which time the patient should be under very close observation. Kimball believes that there is no danger in the routine prophylaxis of goiter as it is carried out through the schools, namely, the administration of 10 mg. of iodin weekly. The evaluation of the use of iodin in hyperthyroidism belongs in a separate category. During the last few years its use has gained a new vogue. However, as now used, iodin has not been shown to be sufficient to suppress the disease permanently. (Jour. A. M. A., Dec. 19, 1925, p. 1970.)

COD LIVER OIL SUBSTITUTE

If an infant has rickets and an idiosyncrasy against cod liver oil, actinotherapy in the form of sun baths or ultraviolet ray exposure should be employed. Cod liver oil extract and irradiated foods have not yet been developed to a sufficient extent to be commercially obtainable in reliable form. (Jour. A. M. A., Dec. 19, 1925, p. 1986.)

MISTAKEN DIAGNOSES OF ACUTE APPENDICITIS*

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Probably the most useful papers for the advancement of medical sciences are: (1) those which have to do with original research work and (2) reports of large series of carefully worked out cases in which the results have been favorable. But for the men in general practice there is something to be learned by going back over the ground which has been covered and reviewing in particular some of the mistakes which have been made and which might have been avoided with a little more care. And so this paper will deal with the review of some cases in which mistakes were made in the diagnosis of acute appendicitis. I believe that the same errors are continually being made in general practice, and for the same reasons. The diagnosis of acute appendicitis seems fairly simple; yet with the advent of hospitals in the smaller places and the arrival of the modern doctor who can always remove an appendix, the number of unnecessary appendectomies is probably increasing. We are taught to get the appendix out before it ruptures and in our feverish anxiety to do so, no doubt we often get it out before it has become inflamed, and thereby overlook the real cause of the patient's trouble, which may not be surgical at all.

Case 1.—A few years ago, while an interne at a large private hospital in Minneapolis, I was called in the middle of the night to assist a well known doctor who had brought in a patient with the diagnosis of acute appendicitis. The patient was a young woman who had developed that day a pain in the abdomen, mostly on the right side, and pains in the back, vomiting, and a temperature of 103. A normal looking appendix was removed and for the next three days she continued to run an unexplained temperature of 103 to 104 and complained a great deal of backache. On the fourth day she broke out with smallpox. The high fever and the backache, if given equal consideration in diagnosis with the pain in the abdomen, would at least have prompted delay and operation might have been avoided.

Case 2.—A few months later, while an interne at a large charity hospital in Minneapolis, I assisted at an appendectomy done during the afternoon as an emergency by a prominent staff surgeon on a boy, aged 12, who had begun to complain a few hours before of pain in the lower right abdomen, vomiting and headache. A normal appendix was removed and twelve hours later the boy died of cere-

*Read before the Southern Minnesota Medical Association, Owatonna, Minn., May 18, 1925.

bro-spinal meningitis. The significance of the headache and vomiting was lost in the undue weight placed on the pain in the abdomen.

Case 3.—The patient, a married woman, aged 30, was seized with severe pain in the right lower abdomen, centering over McBurney's point, and when seen a few hours later had a temperature of 104 and was so tender over the lower right abdomen that she could hardly be touched. There was no complaint of pain in the back or of any bladder symptoms. There was no hospital in our town at that time and a snowstorm was in progress, so that trains were blocked. It seemed so certain that she had an acute appendix that under great difficulties we operated on her at home and took out a very small and very normal looking appendix. On the day after operation she began to complain of frequency and continued to run a high fever for several days. Microscopic examination of the urine, which had not been done before operation, revealed a large amount of pus. She recovered in a few days and has had several similar attacks since. She has since had a complete urological examination and a diagnosis of intermittent pyelitis was made. The high fever should have served as a warning and a microscopic examination of the urine might have saved the patient an operation and the doctors a lot of worry.

Case 4.—About eighteen months ago a female child, aged 7, was seen in consultation at the hospital at the request of the child's parents. She was about to be operated upon under ether anesthesia for acute appendicitis. She complained of pain over the lower right abdomen and was very tender to touch. Her temperature was 102 and she had a jerky little cough. Careful examination revealed slight dullness over the base of the right lung and we made a diagnosis of early lobar pneumonia, but could not definitely exclude an accompanying appendicitis. The parents elected immediate operation as long as there was any doubt, though it was explained to them that her trouble could all be due to a diaphragmatic pleurisy. The choice of anesthetic was changed to local and a normal looking appendix was removed. The child ran a normal course of pneumonia and recovered, apparently no worse for the operation. With definite findings in the chest, elicited by careful examination, it would certainly have been reasonable to wait, and an unnecessary operation, which fortunately was done under local rather than general, might have been avoided.

Case 5.—A middle-aged man suffered for several hours with severe pain in the lower right abdomen before calling a doctor. He vomited several times, had no urinary complaint or radiation of pain to the genitalia, was tender and rigid over the lower right abdomen; temperature was normal. At operation a small appendix was removed and it did not seem enough to account for his trouble. However, he made an excellent recovery, not again complaining of pain after awakening from the ether anesthesia. A few days later he had slight pains on one occasion while urinating and passed a small stone. It would seem probable that his pain in the first place was due to a ureteral stone which passed into the bladder while he was relaxed. Microscopic examination of the urine before operation might have revealed some blood cells, but none had been done.

Case 6.—Several months ago a young married woman was seen at the office because she had been told an hour before that she had acute appendicitis and must go into the hospital at once for operation. Her complaint was pain of moderate severity in the lower abdomen, especially on the right side, and nausea and vomiting for several days. According to her story, abdominal palpation had elicited slight tenderness over the appendix. No questions had been asked in regard to her periods. No pelvic examination had been made. Careful history revealed that the last period had been missed three weeks before and that the nausea and vomiting had come on soon after that. Examination revealed several presumptive evidences of pregnancy. She was not operated and seven months later delivered a normal baby. There has never been an attack of anything resembling appendicitis. No doubt many cases of early pregnancy are needlessly operated upon for appendicitis because a careful history and examination are omitted on account of undue prominence being given to the complaint of abdominal pain and vomiting.

Case 7.—A young woman, unmarried, had severe pain in the lower right quadrant for several days, had vomited three or four times, had a temperature of 99.6 when first seen and was very tender and rigid over the lower right abdomen. The attack was her first one and was not associated with her period. A diagnosis of acute appendicitis was made. Operation revealed an appendix that did not seem abnormal, but there was a small amount of serosanguineous fluid in the pelvis and examination of the ovary revealed a ruptured and bleeding cyst. No doubt this is a mistake which is frequently made and which perhaps at times is unavoidable.

Case 8.—A few months ago a farmer, aged 35, was seized with severe abdominal cramps about 4 P. M., while working in the field. When seen at 7 P. M. he was writhing with pain of a colicky nature centering in the lower right abdomen, vomited several times and was tender and rigid over the lower right rectus muscle. His temperature was 99. The urine was negative, an enema gave no relief and a diagnosis of acute appendicitis was made. At operation the appendix did not seem enough to account for his trouble, but nothing else was found except a rather dull bluish hue to the bowels. For one day he seemed better, then began again to have severe cramps and vomiting. This continued for three days, at which time the vomiting was assuming a fecal character, pulse was 180, temperature 100 to 101, abdomen tender all over and the patient rapidly getting worse. Under local an incision was made to the left of the midline, revealing the moderately distended bowel covered with a plastic exudate. A stab wound and tube low down in the pelvis on the left side drained off several ounces of sero-purulent fluid. An enterostomy was made by fastening a catheter into an easily available loop of small intestine. The patient did not vomit again, in a few days the catheter came out and the patient made an uninterrupted recovery. The day after the original operation he told what he had carefully avoided telling before—that he had taken a few drinks of moonshine that day and that the cramps had come on after that. The severity of the cramps and their colicky

nature was atypical of appendicitis and careful inquiry for the information which was not volunteered might have revealed the real trouble.

Two years ago I was called to see a young man who had been sick for ten days and was being treated by the family doctor for moonshine poisoning. He had been drinking moonshine at the onset of his trouble and had been seized with abdominal pains. When seen after ten days he was clammy and blue, pulse was thready and rapid, and abdomen was tender all over. At operation, which seemed almost useless, a general peritonitis was found. His appendix was involved, as was all the rest of the bowel, and while at the time we considered the peritonitis to be secondary to appendicitis, it has since occurred to me to wonder if it may not have been due to infection passing through the wall of the bowel highly irritated by the poisonous drink. In any case, in this day and age. moonshine must be considered in the differential diagnosis of acute abdominal conditions.

No doubt mistakes will be made even with the greatest of care, but hasty diagnosis is responsible for most of them. Probably no case is so urgent that it is not safer to take a little time to study it than to subject the patient to needless and sometimes actually harmful surgery. There is another factor which I believe is responsible for certain hurried diagnoses, especially in acute cases, and that has to do with the psychology of the patient's family. We hear a great deal about the passing of the family doctor. If it is true that our modern system of education is rapidly eliminating that tried and trusted friend of the family so it is true that the trusting family is being eliminated and the doctor who sees an acute case now in the country and does not seem to know exactly what it is may find a new doctor on the case the next day. People like a definite diagnosis, even if it is wrong, hence the flourishing of the cultists, who always know exactly the seat of the trouble.

CONCLUSIONS

1. The number of mistaken diagnoses of acute appendicitis, resulting in needless operation, is probably large.

2. A patient with a temperature very much above normal should be studied carefully before being diagnosed as acute appandicitis. The higher the temperature, the more likely it is to be due to something else.

3. If a microscopic examination of the urinary sediment was done in every case, most of the kidney complaints which simulate acute appendicitis could be excluded.

4. Moonshine must be considered in the diagnosis, especially if the patient is a man and the pain is severe and colicky.

5. We should try to avoid being rushed into too hasty a diagnosis by the family's insistence on a name being placed on the patient's disease.

A year of construction work finds the vision of a great Medical Center in New York approaching realization. The general problems connected with the launching of such a project are in hand and building progress is satisfactory.

Ground was broken for the first unit of the Medical Center on January 31, 1925. This was the combined building which will house Presbyterian Hospital, Sloane Hospital for Women and the College of Physicians and Surgeons. It will cost upwards of $10,000,000.

In spite of difficult excavation, the sub-surface formation being mostly limestone, the construction of this building has proceeded to the point where sixteen tiers of steel are in place for the twenty-two stories of the hospital part of the building. Two floors and part of a third will be utilized by Sloane Hospital.

Adjoining the Presbyterian-Sloane combined hospital is the Harkness Private Patient Pavilion, a $1,500,000 structure donated by Mrs. Stephen V. Harkness and her son, Edward S. Harkness. Work on the Pavilion has proceeded rapidly and its outer shell is practically finished.

The medical college will have thirteen full stories and a tower. It will be connected with the hospital by an axis of the same height. Steel has been erected for the first four floors where the Departments of Administration, Public Health, Physiology and Bio-Chemistry will be located.

Wide interest is being displayed in the New York State Psychiatric Institute and Hospital, which will be one of the institutions of the Center. It will be used by the State for research in the causes and treatment of mental disease. Plans drawn in the State Architect's office have been approved and specifications for bidding are being completed. Only cases of special scientific interest will be housed in the Psychiatric Institute, others being sent to the regular State Hospitals.

The Vanderbilt Clinic, now at Sixtieth Street and Tenth Avenue, will be a part of the Medical Center Out-patient Department, excavation for which has begun.

Sketch plans are being developed for the Neurological Institute, another hospital of the Medical Center. The Institute is now located on East Sixty-seventh Street. A building program is being developed for Babies' Hospital, which will also move to the Center.

It is expected that the institutions of the Medical Center will be in operation late next year.

THE THERAPEUTIC VALUE OF ROENTGEN RAYS*

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The increasing popularity of radiotherapy is causing many physicians to become interested in one or more of its different phases. Unfortunately, this interest too commonly takes the form of an order for a roentgen-ray machine, a small quantity of radium, or an ultraviolet lamp, and is based on little or no preliminary study of the principles underlying the therapeutic usefulness of these agencies, or of their indications and contraindications. Often unconscious of possible dangers, the new disciple proceeds to play with this new variety of fire with more or less unsatisfactory, not to say disastrous, consequences to his patients and sometimes to himself. In general, it would be far better for the physician to refer his patients to a competent specialist. I am aware that this is not always feasible. The physician may live at a distance from such a specialist and must perforce "carry on" as best he can. If I speak of this, it is because from time to time cases are brought to my notice in which a general practitioner has attempted to treat carcinoma of the uterus or some other disease with a portable bedside roentgen-ray unit, or with a fine-focus tube. Such instances are not nearly so rare as one might think. Of course, such attempts at treatment would be ludicrous if they were not so pitiful, and it is a question whether they should not constitute malpractice. Certainly they are an injustice to the patient.

Treatment by roentgen ray is one form of radiotherapy which has gradually assumed considerable importance in dealing with many diseases. In the time allotted to me I cannot hope to cover more than the general principles involved in the employment of such treatment.

The effect of roentgen rays on different tissues of the body varies within fairly wide limits. On the basis of their sensitiveness, tissues and structures may be graded, from the most sensitive to the least sensitive, about in this order: sex glands (testicle and ovary), blood and blood-forming organs (bone-marrow, spleen, lymph nodes), thymus, skin, mucous membranes, fibrous connective tissue, muscle, bone, and nerve.

*Section on Radium and Roentgen-ray Therapy, Mayo Clinic.
Read before the Northern Minnesota Medical Association, Brainerd, Minnesota, August 24-25, 1925.

SEX GLANDS

The sex glands are very sensitive, even to moderate doses of roentgen rays. In the testicle the rays affect chiefly the spermatogonial cells and influence the whole process of spermatogenesis. Such effects vary naturally with the dosage, so that any degree of alteration may be produced. However, even with heavy doses, aspermatogenesis is not induced at once, because cells that have already reached an advanced stage of development, from the spermatocytes of the first order to the adult spermatozoa, are not so susceptible; the alterations produced become discernible only as the spermatogonial cells complete their cycle of evolution. In the ovary the rays act chiefly on the primordial follicles, the sequence of events being much the same as in the testicle. Given a dose of roentgen rays sufficient to destroy all the ovarian follicles, the artificial menopause so induced resembles in every respect the natural cessation of menstrual function, except that it is more rapid.

The action of roentgen rays on the sex glands is occasionally made use of therapeutically. When it is desired to sterilize an individual and the question of preserving internal secretion is not important, such sterilization may be readily accomplished by means of roentgen rays. However, if it is essential to maintain internal secretion, surgical intervention is preferable. In the hemorrhagic diseases frequently encountered in the female, roentgen rays can again be used to diminish ovarian activity and in certain cases to control symptoms, but this requires most careful adjustment of dosage. Because the ovaries of different women vary so much in functional activity, it is impossible in a given case to be certain of adjusting the dosage so nicely as to bring about the desired control of symptoms without producing complete cessation of function. Hence the use of roentgen rays in the treatment of such conditions should be limited to women who have reached, or are approaching, the natural menopause, and who no longer expect or care for children.

BLOOD AND BLOOD-FORMING ORGANS

The action of roentgen rays on the circulating blood consists of a primary leukocytosis bearing chiefly on the polynuclear cells and lasting from a few hours to two or three days, followed by a

steadily increasing leukopenia (destruction of lymphocytes), and after a time by more or less complete regeneration to the normal level. Regeneration occurs after small as well as after large doses, but the rate of regeneration varies according to the dose employed. On the normal spleen and lymph nodes the effect of the rays is limited chiefly to the destruction of lymphocytes and is not nearly so pronounced as when these structures are in a state of hyperplasia from any cause. Hyperplastic lymphatic aggregations are markedly susceptible to radiation, the lymphocytes being destroyed in large numbers and gradually replaced by connective tissue. Roentgen rays have little influence on erythrocytes except after heavy and repeated exposures.

These effects on the blood-forming organs are made use of in the treatment of certain diseases of the blood, spleen and lymph nodes. In leukemia the great capacity of roentgen rays to destroy lymphocytes and to produce leukopenia is valuable, because the leukocytosis manifested by this disease can thus be greatly reduced. In the myelogenous form the treatment is largely concentrated on the spleen, but, if this is not sufficient, the effect can be increased by treatment of the marrow of the long bones. In lymphatic leukemia the treatment is directed to the main groups of lymph nodes, whether superficial or deep, and also to the long bones, if necessary. At first such treatment is remarkably effective, but after it has been repeated a number of times its effectiveness gradually diminishes because of increasing fibrosis; finally the glands become quite resistant to the rays. However, patients with leukemia are often maintained in relatively good condition for several years. The effect of roentgen rays on the erythrocytes is utilized in the treatment of polycythemia. The rays must be relatively penetrating and the treatment continued several months before the erythrocytes can be notably reduced.

The use of roentgen rays in the treatment of hypertrophied tonsils and adenoids has been the subject of much controversy. In children and young adults, with tonsils made up largely of hyperplastic lymphoid cells, the glands can be readily diminished in size by exposure to roentgen rays. However, the rays have no direct effect on abscesses in or near the glands. In some cases the reduction of the gland, brought about by the destruction of the lymphoid cells by the rays, and the consequent shrinkage of the organ, may be sufficient to squeeze out the contents of certain abscesses, but there is no certainty that this will happen. Hence, when the tonsils are infected, surgical excision is preferable. In adults, diseased tonsils are usually the seat of more or less scarring, and in many cases little lymphoid tissue is left. Consequently, roentgen rays cannot be expected to have much influence on such glands.

In cases of simple adenitis the cause should be sought and removed, but the hyperplastic lymph nodes can be more rapidly reduced to normal by exposure to roentgen rays. It has been found that, in whooping cough, as a result of the work of Leonard, Bowditch, and others, the mediastinal lymph nodes are usually much enlarged, and roentgenization of the mediastinum is often extremely useful in relieving symptoms; indeed, in some cases relief is remarkably rapid. In tuberculous adenitis, roentgen-ray treatment is effective, but it must be continued systematically for several months in most cases. The reaction of the glands is definitely slower when patients have been subjected previously to operation, probably because of scarring. It is generally better to aspirate pus from tuberculous abscesses in such nodes by means of a needle introduced, not through the thin fluctuating portion, but through the more normal surrounding tissue so as to prevent the formation of sinuses. Then the roentgen-ray treatment may be given systematically. It is well to give children general exposures to ultraviolet rays as well as roentgen-ray treatment.

THYMUS

An abnormally large thymus gland in infants is remarkably susceptible to roentgen rays; a gland covering a large portion of the thoracic field in a roentgenogram can be reduced to normal size after one or two exposures. In older children the effect is not nearly so striking.

SKIN

The effect of roentgen rays on the skin may be functional, organic, or specific, the organic effects being simply exaggerated functional effects due to heavier dosage. The functional effects consist of temporary epilation or inhibition of glandular secretions. The organic effects consist of permanent epilation, loss of glandular secretions and the destructive changes associated with an inflammatory reaction commonly known as radiodermatitis.

Radiodermatitis may be acute or chronic. In the acute form it varies in degree, but like ordinary burns it is generally classified in three degrees. First degree radiodermatitis, generally known as "erythema," consists, as the name implies, of redness followed by pigmentation and exfoliation. Second degree reaction goes through the same changes as the first degree but they are accompanied by vesiculation, superficial scarring, dryness, atrophy, and, after many months, telangiectasis. The third degree begins in much the same way, except that its different phases are more severe and, instead of returning to normal, the skin gradually becomes edematous and finally ulcerates over the exposed areas. Such ulceration resulting from a single exposure to a small area (no previous exposure ever having been made) will generally heal spontaneously within two or three months. However, if the area is large or if an overdose is given after many exposures, healing will be very slow and the ulcerated area will be very painful.

First and second degree radiodermatitis require no treatment beyond the application twice a day of Dodd's lotion.* Early third degree reaction should be treated in the same way, but when ulceration has taken place the problem is an entirely different one. The chief object is to combat infection so as to favor the early formation of epithelium. Old third degree radiodermatitis, involving soft parts which are flexible and over which the tissues are loose, may require excision and later plastic repair. However, before this is attempted, infection of the field should be carefully reduced by treatment with weak hyclorite solution and by exposure to sunlight.[1]

Roentgen rays have a specific action on the diseased cells in certain diseases of the skin. This is shown by the more or less rapid regression of such lesions with no effect on the surrounding normal skin. In some conditions this apparent specificity is really an indirect result of functional alteration. The use of roentgen rays in the treatment of skin diseases is generally based on the desire to utilize either the functional or the specific effects. In cases of ringworm, roentgen rays have no direct action on the parasite, but by causing a temporary epilation they remove the habitat and in this way give the skin an opportunity to recover.

In hypertrichosis the hair follicles are excessively developed and their functional activity consequently exaggerated. The destruction of such hyper-active follicles requires a roentgenologic dose which would be dangerous to the surrounding normal skin. Consequently, experienced radiologists usually refuse to undertake such treatment. Roentgen rays are useful in the treatment of hyperidrosis, but treatment has to be given cautiously, and repeated many times to bring about the desired reduction in functional activity. The skin of different individuals varies in sensitiveness to roentgen rays. Thus the skin of a red-haired blond is much more sensitive than that of an absolute brunette. The variation may amount to between 10 and 15 per cent.

The specific action of roentgen rays on the pathologic cells in many skin diseases is constantly made use of. In acne vulgaris, roentgen-ray treatment combined with dermatologic surgery (drainage of infected areas) shortens the disease considerably. In acne rosacea the results are not so uniformly good; some cases are improved whereas others are more or less resistant. The subacute and chronic forms of eczema and eczematoid dermatitis generally respond well to roentgen-ray treatment. Certain cases of lichen planus improve and others do not. Small keloids are best treated with radium, but roentgen rays are preferable for large ones. The lesions respond very well and the skin can be thinned down to normal, such a result being purely a question of time. Warts and corns can be permanently removed by means of roentgen rays, although some require heavy doses and a few are quite resistant. Actinomycosis and blastomycosis, when superficial, are distinctly amenable to radiotherapy. Lesions deep in the body, however, whether in the intestines or lungs, are generally not affected and the prognosis in such cases is very bad.

In considering epithelioma of the skin the basal-cell form must be distinguished from the squamous-cell. The former is susceptible to roentgen-ray treatment, and more than 90 per cent of the

*Formula of Dodd's lotion:

Phenol	1.85 gm.
Zinc oxid	15.50 gm.
Glycerin	4.00 gm.
Lime-water (quantum sufficit adde)	250.00 c.c.

After the bottle has been thoroughly shaken, the lotion is poured over a wad of absorbent cotton until the latter begins to drip. This sponge should then be gently dabbed over the inflamed surface, and the lotion allowed to dry. The application should be repeated so that the entire area will be thoroughly covered with the lotion. The second coat should be dry before clothing is put on. This lotion should be applied night and morning for at least two weeks.

cases can be permanently cured. Squamous-cell epithelioma should be excised surgically and radiotherapy should be used in conjunction, preferably before, as well as after, operation.

ANALGESIC EFFECT OF ROENTGEN RAYS

That roentgen rays exert a truly analgesic effect in certain cases is not as well known as it should be, even by radiologists. And yet their pain-relieving qualities cannot be questioned by anyone who has tried them in suitable cases. However, to expect roentgen-ray treatment to stop pain of every description, whatever its cause, is unreasonable and can lead only to disappointment. The pain of early metastatic lesions in bones, such as those occurring in the spine following cancer of the breast, can often be abolished completely or for long periods. This is also true of the pain incident to chronic arthritis and in certain cases of neuralgia.

BENIGN AND MALIGNANT NEOPLASMS

In considering the sensitiveness of testicle and ovary to roentgen rays it has been pointed out that the more nearly embryonic the cell, the more susceptible it is to radiation, while the more adult, differentiated or specialized the cell, the greater its resistance. This is generally true and the cells characterizing various forms of neoplasm behave in exactly the same way. Tumors derived from structures highly susceptible to roentgen rays are themselves very sensitive to them. Thus malignant embryoma (also known as seminoma), which is a common variety of testicular neoplasm, is highly susceptible to roentgen-ray treatment, both in its primary and secondary manifestations.

Tumors of large size melt away in a short time. Indeed, this quick reaction can be made use of to distinguish such tumors from other varieties which are much less sensitive, such as true carcinoma or sarcoma of the testicle, and the relatively benign true teratoma. Since most ovarian tumors belong to the carcinoma or sarcoma group, the reaction is very similar to that of corresponding tumors in the testicle; that is to say, they are only moderately or slightly sensitive. In many tumors, correct roentgen-ray treatment frequently brings about considerable improvement. However, few permanent cures are obtained.

Malignant lymphoma. — Lymphosarcoma and Hodgkin's disease, being derived from lymph nodes, are also markedly affected by roentgen-ray treatment. Many cases, even in fairly advanced stages, can be restored to normal for a period varying between several months and several years. The rapidity with which the enlarged nodes diminish in size is also characteristic, and is not approached by any other variety of malignant disease with which it might possibly be confounded.

Uterine fibromyoma. — The common beneficial effect of roentgen rays in cases of uterine fibromyoma is due partly to the influence of the rays on the ovaries and partly to a direct action on the cells of the tumors themselves. Since such treatment involves the production of an artificial menopause through destruction of the functional activity of the ovary, it should be restricted to women who are approaching the natural menopause and who present no urgent symptoms, such as excessive bleeding. If the tumor extends above the umbilicus, if the patient is still young enough and is anxious to have children, if there is evidence of calcification in the tumor, or if the bleeding is excessive and demands immediate control, operative treatment should by all means be considered.

Endothelioma.—This variety of neoplasm is relatively susceptible to roentgen-ray treatment and the primary lesion generally responds well.

Giant-cell tumors.—Giant-cell tumors are also satisfactorily treated by roentgen rays. From two to six weeks after a heavy dose of roentgen rays, the tumor undergoes a reaction accompanied by swelling which may give the observer an impression that the tumor is growing more rapidly. This is only a temporary phase of the reaction. A little later the swelling subsides, the tumor itself gradually disappears and bony regeneration takes place.

Carcinoma.—The sensitiveness of carcinoma depends on the organ in which it is situated. This variety of tumor is always much less sensitive than growths such as lymphosarcoma or testicular tumors; yet many of them can be greatly influenced and kept under control for considerable periods. Carcinoma of the thyroid gland is the most sensitive variety of carcinoma. Many of these cases do very well following thorough radiotherapy.

In cases of carcinoma of the cervix the best form of treatment is radium locally to and into the cervix, and roentgen-ray treatment from the outside. It is necessary thus to supplement the radium with roentgen-ray treatment, because the maximal effect of the radium is limited to a zone of approximately 2 cm. around the radium unit employed, the

outlying elements not receiving enough dosage to be of any consequence.

In cases of carcinoma of the breast it is sound practice to give a preliminary course of roentgen-ray treatment, after about six weeks to perform a radical operation, and to follow this by roentgen-ray treatment. However, circumstances may not permit such a procedure and it is then customary to give the roentgen-ray treatment only after operation. The old idea of repeating such treatment once a month for a long time after operation has ben discarded, because, if the dose is adequate, from one to three courses should be sufficient; if it is not adequate, indefinite repetition would be useless. More time must elapse before conclusions can be drawn with regard to the final results from the roentgen-ray treatment of carcinoma of the breast.

Sarcoma.—The reaction of sarcoma is dependent on the rule that the more cellular the tumor the more sensitive it is to roentgen rays; therefore, the round-cell varicty is the most sensitive and the osteosarcoma the most resistant. However, inasmuch as a highly cellular neoplasm is more active and metastasizes earlier than a less cellular one, it is common to see a splendid primary result defeated by metastasis to the lungs or elsewhere.

DOSAGE

It is beyond the scope of this paper to attempt to make a detailed statement of the dosage of the roentgen rays employed in treating such varied forms of disease as those mentioned here. I shall, therefore, limit myself to the more general factors involved in the selection of the dose required to deal with a given disease.

There is widespread confusion among physicians concerning this point, largely because of several misleading expressions which have obtained currency. One of these expressions is "deep therapy," which means absolutely nothing, because all roentgen-ray treatment is more or less deep, according to the quality of the rays employed. A beam of roentgen rays is made up of rays covering the entire scale of wave-lengths falling within a certain range of the spectrum. The proportionate selection from this range can be altered within certain limits by filtration, and again, by changing the voltage applied to the tube. Thus, when we have to deal with a disease of the skin, especially when not accompanied by much thickening of the integument, it is preferable to use rays of long wave-length, otherwise known as soft rays, so as to have as large a proportion as possible absorbed at or near the surface. Consequently, we employ low voltage and no filtration; low voltage in this case meaning a voltage corresponding approximately to a 6-inch spark-gap, or, if measured by the sphere-gap method, one of about 80 peak kilovolts.

A great deal of care must be used in dealing with skin diseases. The treatment requires experience and a thorough knowledge of the capacities and limitations of one's apparatus, as well as accurate methods of measuring the different elements that enter into the dosage. Two chief methods of measuring dosage are in use; one largely employed by European radiologists and the other more commonly used in the United States. The first method involves the use of small discs or pastilles of barium platino-cyanid. Roentgen rays cause these pastilles to change color, and this color change can be compared to a standard furnished with the pastille outfit, and the dose thus determined. The method requires much practice and experience before one can become sufficiently expert and accurate. It has the disadvantage of bringing in a considerable personal variation in reading the changes in color.

The second method involves no special apparatus, but it does require test exposures on the skin of human beings under carefully controlled electrical conditions. From such tests a standard skin unit is established, and once this is accomplished it becomes a simple arithmetical problem to calculate any dose required. We owe this method to MacKee of New York, and any one who attempts to treat skin diseases by means of roentgen rays should by all means make himself thoroughly familiar with it.

Another radiologic expression often misleadingly employed is "the erythema dose." By itself this expression merely means the dose of roentgen rays that produces redness of the skin. Now, it is possible to produce such erythema with roentgen rays generated under a wide range of conditions; consequently the expression "erythema dose" has no meaning unless accompanied by a statement of the exact conditions under which such a dose was obtained. These conditions include the peak voltage, the filtration, the distance from the focus of the anti-cathode to the skin, the number of milliamperes of current passing through the tube, and the time of exposure.

If the disease to be treated is situated in the lymph nodes entirely beneath the skin, we employ somewhat harder rays so as to increase the proportion that will pass through the skin unabsorbed to reach the diseased structures. In such cases it is customary to employ rays generated at a voltage ranging between 100 and 140 peak kilovolts, measured by the sphere-gap method, or corresponding to a spark-gap of between 8 and 10 inches. When we are dealing with neoplasms deep within the trunk, and, especially, with the more highly malignant varieties of neoplasm, it becomes necessary to use the greatest possible proportion of the hardest roentgen rays available, and these can only be obtained at high voltage and with a thick filter. This statement constitutes a general rule of conduct to which there are some exceptions. Certain diseases, such as Hodgkin's disease and lympho-sarcoma, involving the lymphatic glands throughout the body, including those in the mediastinum and abdominal cavity, generally do not require so-called "high-voltage" treatment. Hyperplastic conditions of the lymph nodes are unusually susceptible to roentgen rays even at moderate voltages, and judicious treatment under such conditions is usually preferable to more radical procedures, because it tends to minimize the systemic reaction, which so commonly follows roentgen-ray treatment, and is tolerated better by the average patient. This is true even in the presence of large mediastinal and abdominal tumors of this nature. Much the same is true of the primary and secondary manifestations of malignant embryomas of the testicle. Now that we are recovering our senses following the craze which led many radiologists to treat everything with high-voltage roentgen rays, we are beginning to realize a little more clearly that to focus one's attention and efforts too sharply on the disease and to lose sight of its unfortunate victim is not sound medical practice.

Finally, I cannot emphasize too strongly the point that the ability to employ roentgen rays effectively as a method of treatment cannot be acquired by the mere purchase of a roentgen-ray machine, but requires as much special knowledge as any other special branch of medicine.

BIBLIOGRAPHY

1. Desjardins, A. U., and Smith, F. L.: Radiodermatitis and its treatment. New Orleans Med. and Surg. Jour., 1924, lxxvii, 177-183.

CALCIUM LACTATE AS A PREVENTIVE IN MIGRAINE

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St. Paul

Some twelve years ago, I wrote a paper on ophthalmic migraine. By chance, a reprint, a few months ago, fell into the hands of a young woman employed at the State College of Washington, who suffered from this form of the disease. She wrote me asking if anything more had been learned since the writing of this paper, about the treatment of migraine. I advised the use of calcium lactate. Recently, I again heard from her; she wrote me as follows: "Calcium lactate works wonders with me; without it, I always counted on a full day of severe headache, following the appearance of the typical visual hallucinations, while now a dose of calcium lactate gives relief from practically all the nerve-racking pain and difficulties I used to have to expect as the usual thing. On several occasions I have made long drives in the car shortly after the beginning of the scintillations; before the use of calcium I would not have dared to have attempted this. I experience a double relief—that of the physical agony and that of the mental worry and dread incident to the attack. I carry it with me at all times; I never want to be without it."

Case 1. In Miss A., aged 27, the headache began when she was fifteen years of age; the attacks occurred at irregular intervals, usually every six or eight weeks. The pain, generally unilateral, was followed by nausea. Five or ten grains of phenacetin sometimes gave temporary relief; the headaches lasted from twelve to thirty-six hours. She retires perfectly well, to be awakened during the night by a severe headache. In an hour's time after taking 30 grains of calcium there is only a slight heaviness; an hour later this has disappeared. The attacks, since its use, are much milder and very much farther apart.

Case 2. Mrs. H. is forty-seven years old. She has suffered from migraine since her fourteenth year. The seizures occurred irregularly from once a week to once a year and lasted from ten to twelve hours. During the last two years, she has an attack before the menstrual period. Usually she is sleepless for several nights and she experiences a dull, achy feeling on rising. Pain generally is felt over the left eye; occasionally the pain is felt first over the right eye; it reaches its maximum in three or four hours. Vomiting then occurs but it affords no reief; the duration is from two to three days; of late the pain has greatly increased in severity. If given in time, calcium lactate arrests the seizure and there is no pain for several hours, after which it locates itself in the cheek-bones and over

the supraorbital notch—never on both sides of the face at the same time, but the next time the opposite side of the face is involved. The pain lasts three or four days; it may cease for several hours and then return—evidently a facial migraine. The facial migraine may occur independently of the hemi-cranial attacks. The entire face and forehead may he affected or thc pain be localized to a small area. Calcium lactate does not relieve the facial type. Phenacetin and aspirin give no relief.

Case 3. Miss L., aged 30; developed migraine in her twenty-third year. The attacks occurred irregularly. The premonitory symptom—yawning—prccedes the attack about eight hours. Pain over one or the other eye grows steadily worse, reaching its maximum in eight or ten hours. Then vomiting occurs; nausea is experienced in periodic waves, associated with a cold perspiration and a sensation of great weakness. Tongue and lips are dry; there is a feeling of feverishness. After the pain over the eye ceases, relief is experienced for some hours, there remaining a feeling of exhaustion, with an inability to take food. Pain then starts in the other cye, accompanied with nausea and vomiting as at the beginning of the seizure. If the alternation of pain from one eye to the other does not occur in the same day, several days may elapse before the second eye is attacked. If the calcium lactate is taken at the appearance of the yawning, the seizure is aborted. If, however, the calcium wards off the attack and there persists only a tired feeling, a recurrence of the headache is inevitable.

Case 4. Mrs. H., aged 45, is neuropathic to the *n*th degree. She has been unable to adjust herself to life's multiform relationships; compromises, constant and increasing, have racked and shattered her nervous system. An outstanding symptom has been pain in the head. Clearly to be differentiated from her various forms of headache was that of a typical migraine. Calcium lactate, if taken early, always relieved this, but failed to benefit her usual cephalalgia.

Case 5. Mrs. E., a patient of many years' observation, is in the early fifties. She has suffered from migraine since girlhood. The attacks occur every four or six weeks. The pain is atrocious and the vomiting exhausting. They come on suddenly, accompanied by great nausea. She is unable to keep anything on her stomach—not even water. Only once has she retained calcium lactate, when relief was complete. The value of the drug in this case, because of this inability to take it, could not be determined.

Case 6. Mr. A., 50 years of age, has been subject to migraine since his youth. The attacks occur every two weeks, more frequently if subject to nervous strain. They begin in the evening; by morning the pain reaches its maximum and ceases at sundown. The first time he took calcium lactate the relief was immediate; if it is taken early, he states, the headache seems to be averted, but after three or four days it always returns; it would seem to defer but not prevent the seizure. This man discontinued the medicine because he fancied it increased the severity of the attack.

No single area of the brain can be held responsible for the symptoms manifested by this disease. The consideration of migraine as a vaso-motor neurosis, an anaphylactic phenomenon, or a protein poison is not germane to this report; also, it is the prevention not the treatment of the attack that concerns us chiefly. Therapy, unfortunately, is wholly empirical and most unsatisfactory. The long list of so-called remedies bear witness to this.

The late Dr. Byrom Bramwell prescribed phenacetin in heroic doses; he gave 30 grains of phenacetin when the first symptoms appeared. This was repeated the second or even the third time, at an hour's interval if required. Another sedative drug of merit is luminal in small doses, avoiding drowsiness, as advised by Wilfred Harris. Dr. Hurst believes that in migraine there is a constitutional tendency for the brain to become under certain conditions a storm center. Do these patients possess a peculiar inability to utilize calcium? Is this an explanation of the brain instability? It would seem from the remarkable benefit derived from the use of this drug that this is highly probable.

Prof. Henry C. Sherman of Columbia states that the ordinary diet of Americans in cities and towns is probably more deficient in calcium than in any other chemical element. The body contains normally about three pounds of calcium. There is a psychical factor in migraine that must be taken into account. Sir John Herschel found that he could induce an attack of migraine by picturing in his mind the visual phenomena which characterize an attack. Dr. Hurst reports that one of his patients would experience an attack by looking on a wall paper which had a zigzag pattern. Might not, he asks, the regularity of the every Sunday morning attack or those on the first day of the menstrual period be due to expectancy?

Calcium lactate is harmless; rarely irritates the stomach. Thirty grains should be given immediately at the first warning of an approaching attack. The tablets should always be kept on hand and they should be fresh. Age renders it inert. Calcium lactate does not cure migraine but in a majority of cases it prevents the attack and in certain instances the seizures become much milder and the interval between them is greatly prolonged—in fact, so inconsequential do they become that the patient pays no further attention to them.

MINNESOTA MEDICINE

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VOL. IX FEBRUARY, 1926 No. 2

EDITORIAL

Asexualization

An article by Dr. J. H. James, "Asexualization—A Remedy for Crime and Criminality," in this issue of MINNESOTA MEDICINE raises some very interesting questions.

Before any adequate plan for dealing with crime and criminals can be devised, it is necessary to study the physical and psychological make-up of criminals and to decide just what is meant by crime. A criminal may be a man who rapes a woman, who holds up a bank, who kills his daughter's betrayer, who sells whiskey, or who forges a check. He may be super-intelligent, of average intelligence, or feeble-minded, epileptic or suffering from dementia precox. Crime is such an inclusive term that it may mean anything. It is obvious that the word "crime" is as extensive as the word "sickness." Sickness must, of course, be analyzed into various diseases before it can be dealt with, and in the same way crime must be analyzed into its various aspects before it can be dealt with.

It may be supposed, however, that those that advocate asexualization of criminals would apply their treatment only to habitual criminals who commit serious offenses. Many surveys, especially those made by the National Committee for Mental Hygiene, have shown that a large percentage of habitual criminals are suffering from a mental disease or mental defect. The problem then largely is: Shall people suffering from mental defect or mental disease be made sterile? In the case of feeble-mindedness, it is not at all proved that mental defect is inherited in the way that has been claimed.

Dr. Abraham Myerson in his book, "The Inheritance of Mental Disease," feels that much of the work on feeble-mindedness has been uncritical and inadequate. He utterly disbelieves that "mental deficiency is a menace to the world because it is strongly hereditary and because the feeble-minded are prolific beyond the normal." He is of the opinion that those cases of feeble-mindedness which are actually familial originate in reality from an injury to the germ plasm from without. In discussing the psychoses, Dr. Myerson does not believe that psychoses are inherited in any such fatalistic way as claimed by some biologists.

H. S. Jennings, a leading biologist, goes so far as to say that "man is characterized by the possession of many sets of inherited characteristics, the decision as to which shall be produced depending on the environment." Jennings goes on to point out that the behavior of every human being always depends on two factors — hereditary tendencies modified by environment.

If this is true, and most modern biologists hold this view at the present time, anti-social behavior, which we call criminality, is due as much to the environment as to heredity. We venture to say that Gerald Chapman may have had children who, if reared under the proper environment, might be just as intelligent and just as useful to society as the children of a banker or college professor.

It is our feeling that it would be unwise in our present state of knowledge for physicians to advocate laws for the sterilization of habitual criminals. More study is needed. There is very little evidence at the present time that such laws would benefit society in helping to rid itself of the professional criminals.

SMILEY BLANTON, M.D.,
Child Guidance Clinic, Minneapolis.

Superannuated Physicians

Throughout the United States there are doubtless many aged physicians who are incapacitated and in want as a result of the infirmities of old age. There are without question many widows and children of departed members of the profession who need material assistance.

In an effort to meet this need the Physicians' Home, Inc., was organized several years ago in New York state. A farm in New York state was donated to the organization to serve as a home for aged and dependent doctors and from last reports four doctors had availed themselves of the opportunity offered.

Recently steps have been taken to raise a fund to further the work of the organization. It is the plan, if sufficient funds are raised, to establish homes similar to the one in New York in various parts of the United States. No avowed campaign is being launched but physicians all over the country are being requested to lend their names in support of the undertaking and efforts are being made to raise a substantial sum.

At the San Francisco meeting of the American Medical Association in 1923 a resolution of the House of Delegates was passed expressing approval of the undertaking. The names of some prominent members of the profession have become associated with this project, and the officers, headed by Dr. Roger T. Morris, who seems to be the leading spirit, assure the reliability of the venture.

Nevertheless, it does seem as though it would be well for the same organization or possibly the American Medical Association to make a national survey of the situation to determine, first, how great a need exists, and, second, whether in case a number of homes are provided throughout the country it is likely that they will be patronized. Four physicians in New York state taking advantage of the home already established is not a convincing argument that homes of this sort are likely to solve the problem.

Somewhat over a year ago we called the attention of our readers to the desirability of establishing a fund for the relief of superannuated members of our State Association and their dependents. The question has come before the Council of our Association on several occasions. Unfortunately, the State Association has never been so overburdened with wealth that it could set aside any suitable sum for this purpose.

We are still of the opinion that each state can best handle its own problems of this sort. It would be a relatively simple matter for our House of Delegates to authorize the Council to set aside a separate fund for this purpose. Here would be a worthy object for bequests on the part of our wealthy members. A beginning having once been made it is quite possible that in time a very substantial endowment might easily be established. We recommend a consideration of this subject to the House of Delegates when it meets in May.

The County Society

The county medical society attains an end which is not reached by the state or national association.

The writer used to belong to a medical society which at its regular meetings would get out the card tables and play whist, and where any kind of a paper was looked upon as an anomaly. Now, the local society sacrifices to the social deity with a banquet.

Much good accrues apart from scientific gains in county society meetings. One observes that his confrere is not as black as rumor and distance have indicated. At the banquet he ingests—late at night—quite as largely as anyone, and, indeed, seems, strangely enough, quite human and probably not after all merely a cold-blooded money-maker.

Before or after the dinner the older practitioner listens to the paper of the younger man who has not forgotten the case reports of his interneship with its wealth of laboratory detail. The younger man praises—let us hope not ironically—the large experience of the other.

The state and national associations did well in making membership in the county society a prerequisite to membership in the larger bodies.

One notices, too, that—in some parts of Minnesota at least—the average membership is not growing older eleven months a year, as we are assured it is in the country districts at large. A proportion of the younger men are to be found in the country and are not immediately becoming what Eugene Murphey calls gimlet-eyed young specialists in the cities.

H. B. A.

COMMUNICATIONS

To the Editor:

As per your request, I am submitting briefly misinterpretations of the Narcotic Law, made by physicians, as found by Narcotic Agents and Inspectors.

Special Tax Stamp.—Seldom does he have his Tax Stamp posted in a conspicuous place.

Inventories.—The affidavits made at the time of payment of the Taxes are misplaced.

The Order Forms.—Original Forms missing, duplicate forms blank, failing to insert the date on the form, and failing to keep duplicate orders on file two years ready for inspection.

Records.—Physicians must keep separate records to account for drugs purchased, showing date, name and address of patient, kind and quantity of drugs dispensed, the only exception being drugs personally administered by the physician to his patient away from his office. See Art. No. 126, Reg. No. 35.

Prescriptions.—Are for patients *only*, not for "*self*" or "*Office Use.*" Must be written with ink or indelible pencil, or typewritten, then must be signed with ink or indelible pencil. Prescriptions must bear the following information: Date; Name and Address of Patient; Name, Address and Registry Number of Physician. Where certain patients are receiving narcotic prescriptions regularly, the physician must show on each prescription the purpose it is intended for. See Art. 117, Reg. No. 35.

Refill Prescriptions.—The refilling of a narcotic prescription is prohibited, therefore a physician's order "Refill Rx. No. —," cannot lawfully be filled by a druggist. See Art. 120, Reg. No. 35.

Telephone Instructions. — A druggist cannot send out medicines containing narcotics pursuant to telephone advice of physicians. See Art. 121, Reg. No. 35.

Last, but not least, the Narcotic Agents and Inspectors are their friends and anxious to oblige and advise. Physicians should not feel that the Agents are trying to molest or get something on them.

A perusal of the above, Doctor, will show you how easy it is to comply with the Narcotic Law and Regulations.

Respectfully,

JOHN HESSE,
Narcotic Inspector.
H. H. WOUTERS,
Narcotic Agent in Charge.

To the Editor:

In a bulletin of the Treasury Department this day received at our office, a decision was handed down to the effect that legal expenses incurred by a doctor in the defense of a civil suit for malpractice are allowable deductions as business expenses; while expenses incurred in a criminal action brought against the doctor for instance for violating the narcotic law would not be deductible.

Very truly yours,

OPPENHEIMER, DICKSON, HODGSON, BROWN & DONNELLY.

By W. H. OPPENHEIMER.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

INTER-STATE POST GRADUATE FOREIGN CLINIC ASSEMBLIES
1926

The 1926 foreign clinic assemblies given under the direction of the Inter-State Post Graduate Assembly of North America will cover a territory including the chief clinic cities of Italy, Switzerland, Germany, Austria, Czecho-Slovakia, Holland and Belgium.

The physicians are going abroad as the result of invitations extended, through this Association, by the leading medical universities and institutions of the countries to be visited to the medical profession of North America.

The members of the party will sail from New York on April 28, a few days after the meeting of the American Medical Association at Dallas, Texas, thus giving the physicians of the party plenty of time to attend this meeting.

The large first-class cruising steamer, the "Araguaya," of the Royal Mail Steam Packet Line, has been chartered to take the physicians abroad. The party will land at Cherbourg and will go at once to Paris, where the clinic assemblies start.

Dr. Carl Beck of Chicago, the General Secretary for the foreign assemblies, is now in Europe completing the clinic arrangements for the assemblies. The clinic cities to be visited are as follows: Paris, Rome, Florence, Padua, Milan, Berne, Zurich, Munich, Vienna, Prague, Berlin, Amsterdam, The Hague, Utrecht, Leyden and Brussels. There will be extension assemblies held in all other principal medical centers of Europe following the main assemblies.

It is of interest to note that a large percentage of the distinguished teachers, who will instruct the assemblies, speak the English language. However, there will be a director chosen from the teaching staff in each of the clinics, who will be able to speak good English in case the chiefs do not. It will be the duty of this director to present the history cases and to answer questions as an interpreter. This is one of the reasons why Dr. Beck is now in Europe.

The assemblies are open to members of the profession who are in good standing in their State or Provincial Society with no restriction to territory. This invitation is understood to be extended to the entire medical profession of North America.

Admittance to the clinics and privileges of the tour will be protected by the issuing of an admittance ticket or card. This rule will be strictly enforced in order to protect the Association in its membership requirements, which is, that a physician must be in good standing in his State or Provincial Society. We will not be responsible or admit physicians to privileges unless they are members of the group.

The members of the party will be limited to a number that can be accommodated comfortably in both the clinics and hotels. After careful consideration and consultation with the transportation department and the foreign clinics,

this number has been fixed at five hundred, which includes members of the physicians' families. Necessarily, this will limit the number of physicians to around three hundred.

Physicians may return home on three separate sailings during the main assemblies. First, at the end of the visit to Italy and Switzerland by way of Cherbourg; second, at the end of the visit to Holland from Rotterdam, and third, at the end of the assembly in Brussels from the port of Antwerp.

It is necessary in order to hold space for the assemblies to send to the office of the Managing Director, W. B. Peck, Freeport, Illinois, the sum of $65 per person. If for any reason the applicant for space decides that he cannot attend the assemblies, the money will be refunded immediately, if this demand is made as early as six weeks before sailing time. A booklet of information pertaining to the assemblies and prices for same may be secured free of charge by writing the Managing Director's office.

Ladies' Entertainment: Besides the extensive sightseeing and travel features, arrangements are being made for a ladies' entertainment committee in each of the clinic cities. The committees will be composed of the wives of the clinicians and prominent citizens.

In offering the foreign clinic assemblies this Association has the hearty co-operation and assistance of the most distinguished teachers and clinicians in both North America and Europe. The organization in its endeavors hopes to combine with its success in post-graduate work a corresponding advancement in International goodfellowship among the members of the medical profession of the different countries of the world.

The officers of the assemblies are:

Dr. Charles H. Mayo, Chief Executive and General Chairman, Rochester, Minnesota.

Dr. Carl Beck, General Secretary, Chicago, Illinois.

Dr. William B. Peck, Managing Director, Freeport, Illinois.

Mr. Reeve Chipman, Manager of Transportation, Boston, Mass.

A second section of the assemblies for a limited number will be conducted during the summer months for those who are unable to take advantage of the April sailing. The members of the party will leave New York, S.S. "Pittsburgh," on June 19, return sailing, August 13, from Antwerp, S.S. "Zeeland."

MINNESOTA STATE MEDICAL ASSOCIATION

Owing to the fact that the American Surgical Association will meet the week of May 24, it has been decided to change the date of the meeting of the Minnesota State Medical Association to May 17, 18 and 19, 1926.

AMERICAN BOARD OF OTOLARYNGOLOGY

An examination will be held by the American Board of Otolaryngology in Dallas, Texas, on Monday, April 19, 1926, and in San Francisco, California, on Tuesday, April 27, 1926.

Application should be made to the Secretary, Dr. H. W. Loeb, 1402 South Grand Boulevard, St. Louis, Missouri.

CONGRESS ON INTERNAL MEDICINE

The Tenth Annual Congress on Internal Medicine will be held at Detroit and Ann Arbor, week of February 22-27, 1926.

The Congress is devoted to amphitheatre, bedside and clinical laboratory demonstrations as well as to symposia dealing with modern phases of internal medicine. Distinguished guests from abroad, Canada and the leading clinics of the United States will occupy prominent places on the program. Four days will be devoted to the work at Detroit and on one day the society will be the guest of the University of Michigan at the newly opened eleven-hundred-bed University Hospital.

All physicians who are interested in internal medicine and who are members in good standing at their local and national societies are cordially invited to attend the Congress.

Hotel headquarters will be at the Book-Cadillac in Detroit. Information regarding reduced railroad rates, program, hotel accommodations, etc., may be secured from the Secretary-General.

C. G. Jennings, M.D., President,
American Congress on Internal Medicine,
Detroit, Mich.

Frank Smithies, M.D., Sec'y-Gen'l,
920 N. Michigan Avenue,
Chicago, Ill.

PARK REGION DISTRICT MEDICAL SOCIETY

The Park Region District Medical Society met January 13 at Fergus Falls. A very interesting program and entertainment was preesnted to the attending physicians and their wives.

The following papers were presented:

1. Headaches. Dr. T. S. Paulson, Fergus Falls.
2. Malarial Treatment of Paresis. Dr. W. L. Patterson, Fergus Falls.
3. Case Reports. Dr. W. L. Burnap, Fergus Falls.

A reception for the ladies was held at the residence of Dr. and Mrs. Burnap, at which time an auxiliary of the association was organized. Mrs. A. C. Baker of Fergus Falls was chosen President; Mrs. P. Boysen of Pelican Rapids, Vice President; Mrs. W. L. Patterson of Fergus Falls, Secretary, and Mrs. W. A. Wray of Campbell, Treasurer.

After a banquet, held at the Kaddatz Hotel, Dr. Hilding Berglund, University of Minnesota, discussed some recent advances in diagnosis of the gallbladder.

Dr. E. A. Meyerding, secretary of the Minnesota State Medical Association, discussed state medical economic problems and Dr. H. M. Johnson, president of the State Association, outlined plans for the future.

A resolution was passed instructing the delegates to the next state meeting, May 17-18-19, in St. Paul, to vote for an increase of dues to $15 per annum.

The officers of the society are: Dr. P. G. Cowing, Evansville, President; Dr. A. J. Lewis, Henning, Vice President; Dr. Theo. Satersmoen, Pelican Rapids, Secretary-Treasurer.

RICE COUNTY MEDICAL SOCIETY

The annual meeting of the Rice County Medical Society was held at Faribault, Minn., Dec. 18, 1925. Election of officers resulted as follows:

President—Dr. Joseph Moses, Jr., Northfield
First Vice President—Dr. S. B. Haessly, Faribault
Second Vice President—Dr. W. B. Lee, Northfield
Secretary-Treasurer—Dr. Carl A. Traeger, Northfield
Censor—Dr. P. A. Smith, Faribault
Delegate—Dr. F. S. Warren, Faribault
Alternate Delegate—Dr. D. E. McBroom, Faribault

A very unusual, but very practical and helpful program was given. Through the courtesy of the Minnesota Industrial Commission, Mr. Hugo, compensation adjuster for the Commission, gave a thorough discussion of the "Workman's Compensation Law." A general discussion followed. Those members present felt this was an excellent way of becoming more familiar with our State Commission and those who administer it. It was recommended that other societies have a similar program.

OF GENERAL INTEREST

Dr. W. S. Nickerson, formerly of Lonsdale, Minnesota, has taken over the practice of Dr. W. N. Theissen (deceased) at Faribault.

Dr. Frederick Foley and Dr. Philip F. Donohue, St. Paul, will open offices in the near future for the practice of genito-urinary surgery.

The membership of the Minnesota State Medical Association has gone over the 2,000 mark. The registration early in January had reached 2,007.

Dr. P. F. Meyer, formerly of Belle Plaine, has located at Faribault. Dr. and Mrs. Meyer are receiving congratulations on the birth of a baby daughter.

Wm. F. Wittig and Mathilde C. Andresen, chiropractors, of Red Wing were sentenced in November to thirty days in the Goodhue County jail and fined $50 each for practicing without a license. No appeal was taken.

Dr. Harold E. Richardson, St. Paul, formerly associated with Dr. Charles Lyman Greene, announces his association with the St. Paul Clinic. He will limit his practice to cardio-renal disease, including electrocardiography.

Attention is called to an error which occurred in the last number of MINNESOTA MEDICINE. It was stated that Dr. Isaac Abt had been appointed assistant to the staff of St. Luke's Hospital, St. Paul. The reference should have been to St. Luke's Hospital in Chicago.

A very practical book on head injuries has recently been published by the Gorham Press entitled "Practical Helps in the Study and Treatment of Head Injuries," by Dr. Adolph M. Hanson, Faribault, Minn., formerly neurosurgeon to Evacuation Hospital No. 8, American Expeditionary Forces.

The regular monthly meeting of the medical staff of Bethesda Hospital was held December 28 with an attendance of twenty-six members. A paper was read by Dr. V. N. Petersen on the "Prostate Gland," which was followed by a general discussion and reports of cases of general interest. Dr. K. C. Wold presided.

The Annual Congress on Medical Education, Medical Licensure and Hospitals will convene in the Gold Room of the Congress Hotel, Chicago, February 15, 16, 17 and 18, 1926. An interesting program has been planned and an invitation is cordially extended to members of the profession to be present and take part in the discussions of the various papers.

Dr. M. Seham of Minneapolis was selected to make the annual address before the New England Pediatric Society in Boston on January 11. He chose the subject of "Chronic Fatigue in School Children," and reported the results of his and Dr. Grete Seham's researches and observations. While in the East, Dr. Seham was also invited to address the Pediatric Section of the New York Academy of Medicine on the same subject.

An innovation which might well be copied in other cities occurred in Albert Lea when physicians of the town furnished the program at the January meeting of the local Business Men's League. After the preliminary business of the league was transacted, Dr. J. P. von Berg took the chair as toastmaster and the local physicians furnished a program which included historical, public health and progressive phases of the practice of medicine. Such lay meetings serve to acquaint the laity with the facts regarding the practice of the healing art and the general adoption of proceedings of this sort should be of benefit to both the laity and the profession.

In a recent bulletin the secretary of the State Association expresses the desire to be of assistance to the component county societies. The secretary is eager to arrange for the attendance of a state officer at the various county meetings. This arrangement is most desirable in further cementing the relations between county and state organizations.

The county society seldom avails itself of the opportunity to obtain information about new members from the office of the secretary of the American Medical Association. County society records should have as complete information regarding its members as possible.

The Board of Governors of the Mayo Clinic has established the J. William White Scholarship. This scholarship has been made possible by reason of a legacy left to Dr. W. J. Mayo and Dr. C. H. Mayo by the late Dr. White, formerly Professor of Surgery at the University of Pennsylvania.

It was Dr. White's desire that the proceeds from this gift should be used for educational purposes in the Mayo Foundation. In accordance with this wish the Board of Governors has decided that a scholarship should be created, the scholarship to be awarded by the Trustees of the Mayo Properties Association, on the recommendation of the Medical Graduate Committee of the Mayo Foundation, to the graduate (either M.S. or Ph.D. in Surgery in the Mayo Foundation) who, in the opinion of the Committee, is most deserving of an opportunity for study in surgical clinics in foreign countries.

NEW AND NON-OFFICIAL REMEDIES

COUNCIL ON PHARMACY AND CHEMISTRY

The following articles have been accepted:

ARLINGTON CHEMICAL COMPANY:
Pollen Extracts

CUTTER LABORATORY:
Pollen Extracts
Special Pertussis Vaccine-Cutter

ELI LILLY & Co.:
Coco-Quinine

MALLINCKRODT CHEMICAL WORKS:
Sulpharsphenamine-Mallinckrodt 0.1, 0.2, 0.3, 0.4, 0.5, 0.6 Gm. Ampules

H. K. MULFORD CO.:
Insulin-Mulford 10, 20, 40, 80 Units 10 c.c.

PARKE, DAVIS & Co.:
Pollen Protein Extracts Diagnostic-P. D. & Co.
Protein Extracts Diagnostic-P. D. & Co. Group 28;
Protein Extracts Diagnostic-P. D. & Co. Group 29;
Protein Extracts Diagnostic-P. D. & Co. Group 30;
Protein Extracts Diagnostic-P. D. & Co. Group 31.

PHYSICIANS DIAGNOSTIC LABORATORIES:
Concentrated Culture Bacillus Acidophilus-P. D. L.

SWAN-MYERS COMPANY:
Mixed Ragweed Concentrated Pollen Extract-Swan-Myers

E. R. SQUIBB & SONS:
Scarlet Fever Streptococcus Antitoxin Concentrated
Scarlet Fever Streptococcus Toxin for Dick Test-Squibb
Scarlet Fever Streptococcus Toxin-Squibb

TRUTH ABOUT MEDICINES

Boro-Chloretone.—A dusting powder composed of chloretone (New and Non-official Remedies, 1925, p. 91), 1 part; boric acid, 1 part; purified talc, 2 parts. Parke, Davis & Co., Detroit.

Powdered Whole Lactic Acid Milk-Merrell-Soule.—A modified milk preparation prepared from whole milk soured by the action of a culture of *Bacillus bulgaricus*. Each 100 gm. contains approximately butter-fat, 28 gm.; protein, 26 gm.; lactose, 33 gm.; free lactic acid, 4 gm.; ash, 6 gm.; moisture, 3 gm. When suitably mixed with water, powdered whole lactic acid milk-Merrell-Soule is said to be useful in the feeding of infants when a soured milk is indicated. Merrell-Soule Co., Syracuse, N. Y. (Jour. A. M. A., Dec. 5, 1925, p. 1811.)

Ovarian Substance Desiccated-P. D. & Co.—The entire fresh ovary (including the corpora lutea) of the hog and cow, dried in vacuo and powdered. For a discussion of the actions and uses, see Ovary, New and Non-official Remedies, 1925, p. 251. The product is also marketed in the form of five-grain tablets. Parke, Davis & Co., Detroit.

Ovarian Residue Desiccated-P. D. & Co.—The residue from the fresh ovary of the hog or cow after the removal of the corpora lutea, dried and powdered. Ovarian residue is used for the same conditions as those in which the entire ovarian substance is used. The product is also marketed in the form of capsules and tablets containing five grains. Parke, Davis & Co., Detroit.

Insulin-Mulford, 10 Units, 10 c.c.—Each c.c. contains ten units of insulin-Mulford (Jour. A. M. A., June 20, 1925, p. 1917). H. K. Mulford Co., Philadelphia.

Insulin-Mulford, 20 Units, 10 c.c.—Each c.c. contains twenty units of insulin-Mulford (Jour. A. M. A., June 20, 1925, p. 1917). H. K. Mulford Co., Philadelphia.

Insulin-Mulford, 40 Units, 10 c.c.—Each c.c. contains forty units of insulin-Mulford (Jour. A. M. A., June 20, 1925, p. 1917). H. K. Mulford Co., Philadelphia.

Insulin-Mulford, 80 Units, 10 c.c.—Each c.c. contains eighty units of insulin-Mulford (Jour. A. M. A., June 20, 1925, p. 1917). H. K. Mulford Co., Philadelphia.

Ampules Dextrose 50 Per Cent, 20 c.c.—Each ampule contains 20 c.c. of a 50 per cent solution of dextrose U.S.P. Swan-Myers Co., Indianapolis. (Jour. A. M. A., Dec. 12, 1925, p. 1891.)

PROPAGANDA FOR REFORM

Examination of Brands of Cinchophen.—Cinchophen was introduced in the U. S. under the proprietary name "Atophan" by Schering & Glatz. At one time "Atophan" was included in New and Non-official Remedies. It was omitted 1921 because unwarranted therapeutic claims were made for it and for other reasons. As a result of the war, cinchophen was manufactured in the U. S. and at that time the A. M. A. Chemical Laboratory examined the market supply and found this satisfactory. Now the Laboratory reports the results of a re-examination. The Laboratory found that the cinchophen now marketed is still purer than that examined before and that all brands complied essentially with the standards of the new U. S. Pharmacopeia. It is concluded that all the products reported on (cinchophen-Abbott, cinchophen-B.P.C., cinchophen-Calco, cinchophen-M.C.W., cinchophen-Morgenstern and Atophan) are equally good for therapeutic purposes, and one is no better than another. The report of the Laboratory brings out the exorbitant price that the public and the profession have to pay for proprietorship in medicine. Under its non-proprietary name, cinchophen can be purchased for from fifty cents to one dollar per ounce; but "Atophan" costs from $2.50 to $2.75 for the same amount. (Jour. A. M. A., Dec. 5, 1925, p. 1828.)

More Misbranded Nostrums.—The following products have been the subject of prosecution by the authorities charged with the enforcement of the Federal Food and Drugs Act: Gary's Vegetable Ointment (The Sloan and Spencer Medicine Co., Birmingham, Ala.), consisting mainly of kerosene, alcohol, turpentine, camphor and menthol. Sayman's Wonder Herbs (T. M. Sayman Products Co., St. Louis, Mo.), consisting essentially of a mixture of baking soda, powdered ginger, gentian root, rhubarb, licorice, cascara sagrada, buchu, senna, mandrake and buckthorn. Chappelear's Bronchini (Wm. M. Chappelear & Sons Co., Zanesville, O.), consisting of ammonium chlorid, extracts of plant drugs, flavoring material including anise and sassafras oil, sugar, alcohol and water. S-K Remedy (S-K Remedy Co., Oakland, Oregon), composed essentially of vegetable drugs, including aloes and a small quantity of a mydriatic alkaloid, alcohol and water. (Jour. A. M. A., Dec. 12, 1925, p. 1907.)

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

EXPECTANT TREATMENT OF FOREIGN BODIES IN THE STOMACH*

HERMAN J. MOERSCH, M.D., and PORTER P. VINSON, M.D.
Rochester, Minnesota

Many persons, some of them physicians, believe that a foreign body in the stomach, esophagus or air passages demands immediate removal. While in certain instances this may be true, in the majority of cases no such emergency exists.

Even the most experienced endoscopist encounters great difficulties at times in extracting foreign bodies from the esophagus under the most favorable circumstances and with the aid of complete equipment. His difficulties are often increased by previous abortive attempts made by physicians who have little skill in the work and no more adequate equipment than a stomach-tube and forceps. Such methods, although sometimes successful, are attended by too much risk to be instituted at any time, but especially when the foreign body has a sharp edge or is pointed and rough.

Two cases that recently came under our observation at the Mayo Clinic demonstrate the value of expectant treatment, and one case especially illustrates the difficulties that may be experienced as the result of inadequate equipment for all emergencies.

Case 1: A child, aged eighteen months, was admitted to the clinic May 24, 1925. May 21 the child had swallowed an open safety-pin. The home physician was called and he attempted without success to remove it by means of his fingers and a pair of forceps. Two days later esophagoscopy was attempted and the pin was seen high in the gullet. In the endeavor to extract the pin it was pushed farther down the esophagus and all attempts had to be given up because of lack of proper instruments. The following day the child was brought to the clinic. The temperature was 104° by rectum and the pulse rate 160. She did not look as if she would live through the day. A roentgenogram, taken immediately, showed the pin in the esophagus above the cardia (Fig. 1). Esophagoscopic examination was attempted, but on account of the marked injury of the mouth and gullet which had resulted from previous instrumentation and the great danger of perforation through the ulcerated walls, it was deemed inadvisable to continue. Proctoclysis was instituted and all fluids and solids withheld by mouth. By the fourth day the temperature had dropped to normal. Small amounts of water were then given by mouth. May 30, a second roentgenogram showed the pin still above the cardia. Esophagoscopy was again attempted but again was given up on account of the ulcerated condition of the esophagus. Soon after, the child was put on a soft diet which she took without trouble. June 12 a roentgenogram showed that the pin had passed into the stomach (Fig. 2). The following day it was passed by rectum (Fig. 3).

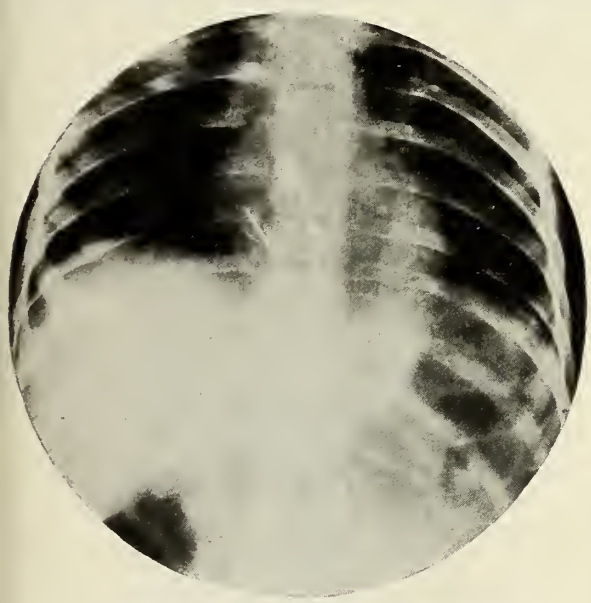


Fig. 1. Location of safety pin in esophagus at time the patient was admitted to the Clinic.



Fig. 2. Same case as Figure 1, three weeks after admission.

Case 2: A child, aged two and one-half years, swallowed a padlock key about 6 cm. long, August 21, 1925. No manipulation was attempted. On roentgenographic examination two days later the key was found in the stom-

*From the Section on Medicine, Mayo Clinic, Rochester, Minn.



Fig. 3. Safety-pin passed by rectum.

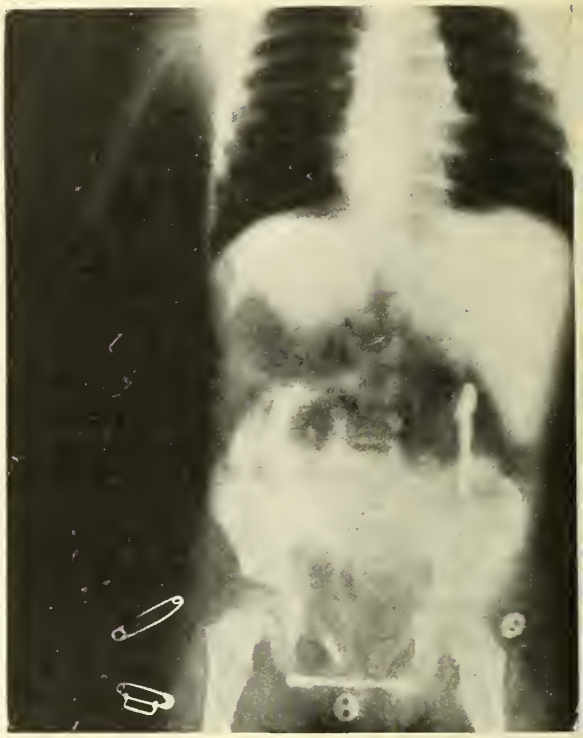


Fig. 5. Same case as Figure 4, seven days after admission.

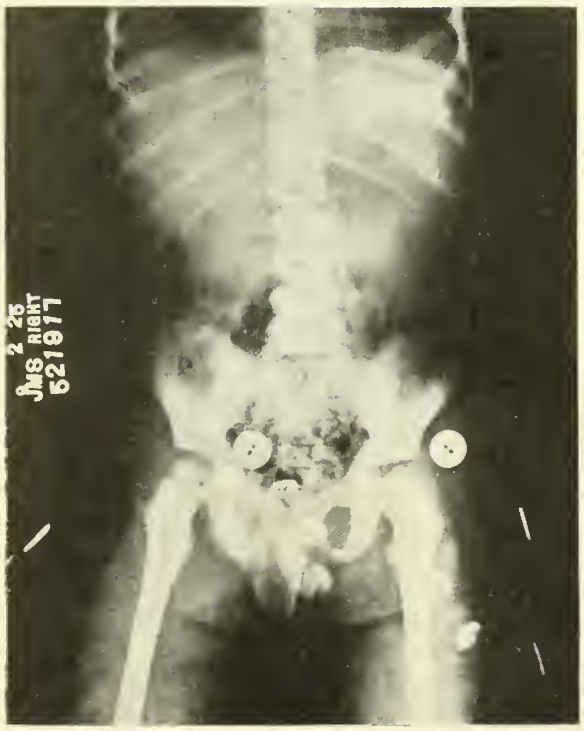


Fig. 4. Position of key in the stomach at the time the patient was admitted to the Clinic.



Fig. 6. Key passed by rectum. **Actual size.**

ach (Fig. 4). Gastrotomy was advised, but the parents refused to give their consent and the child was brought to the Mayo Clinic for treatment. On admission the patient was given full diet and kept under observation (Fig. 5). Eight days later the key was passed by rectum without trouble. (Fig. 6.)

These two cases illustrate fairly well the value of expectant treatment. While esophagoscopy is always indicated in cases of foreign body lodged in the esophagus, when it can be carried out correctly, still the expectant course is always preferable when the requisite equipment and skill are not available, until the patient can be put under competent care. Furthermore, as a general rule, anything that will enter the stomach will pass on through the gastrointestinal tract provided no obstructive lesion is present.

DARLING'S HISTOPLASMOSIS IN THE UNITED STATES: THE POSSIBILITY OF THE FURTHER OCCURRENCE OF CASES*

Wm. A. Riley, Ph.D., and C. J. Watson, M.D.
Minneapolis

At the annual meeting of the American Association for the Advancement of Science held the latter part of December, last, the writers reported on the occurrence of a case of Darling's histoplasmosis in a Minnesota woman who had not been out of the State in forty-two years. More detailed accounts dealing with the clinical and parasitological aspects of the case are in course of publication.

With one exception, the press notices which have come to our attention have been accurate. The exception is the implication that since the disease is tropical we do not consider it probable that other cases would be encountered in Minnesota. Since this is diametrically opposed to our belief in the matter, it seems desirable to make a correction.

Previous to the recognition of the Minnesota case, Darling's histoplasmosis was known only from his reports of the three cases seen by him in the Ancon Hospital, Canal Zone, Panama, in 1905-1906. The patients were two Martinique negro laborers and a Chinese, the last mentioned having lived in Panama for the 15 years prior to his death. No other cases were noted in 33,000 admissions to the Ancon Hospital and until now none have been reported from that source or elsewhere in the succeeding twenty years.

Under the circumstances, it is natural that the idea should prevail that in histoplasmosis we have a rare tropical disease. In the latest edition of the Reference Handbook of the Medical Sciences, Dr. L. B. Bates, 1923, says regarding it: "Although no cases have been seen in Panama since 1906, it is probably to be found in unhygienic and less salubrious regions of tropical America not yet disturbed by the sanitarian."

As we attempted to point out, the finding of an endemic case of histoplasmosis in Minnesota is evidence that it is not a purely tropical disease but that it must be considered as a possible factor in any obscure case of splenomegaly, accompanied by irregular pyrexia, emaciation, and anemia. Special consideration should be given to the possibility that the disease is a type of epizootic lymphangitis of horses, the causative organisms being strikingly similar in the two diseases.

In view of the reported success of the treatment of epizootic lymphangitis by salvarsan, splenic puncture for the purpose of determining the presence of the characteristic, encapsuled parasites in the endothelial cells would be suggested. Smears so obtained should be stained by Romanowsky's, Giemsa's, or even Gram's method in order to bring out the parasites in unmistakable manner.

*From the medical department of the University of Minnesota.

FLY MAGGOTS IN ULCER OF THE LEG: REPORT OF A CASE*

S. E. Sweitzer, M.D., and E. H. Wangelin, M.D.
Minneapolis

The patient, a man, aged thirty-eight years, entered the Minneapolis General Hospital July 12, 1925, complaining of ulcers on his legs.

About six months previous to admission he had noticed a small pimple on the left leg. He applied carbolic acid salve and bandaged the leg, but the lesion increased in size. About three weeks before his entrance to the hospital similar ulcers formed on the right leg. Carbolic acid salve and iodin were applied and the leg was bandaged. The patient had been seen in the Out-Patient Department about a week prior to his admission and at that time he was advised to enter the hospital, but did not do so. Shortly after sleeping in a park, the day previous to admission, he noticed maggots in one of the ulcers.

Examination revealed a poorly nourished and poorly developed male. Ulcers were present in the lower third of both legs, with maggots infesting a large ulcer on the left leg. Urinalysis was normal; the hemoglobin was 90 per cent; w.b.c. 8,100; blood Wassermann negative.

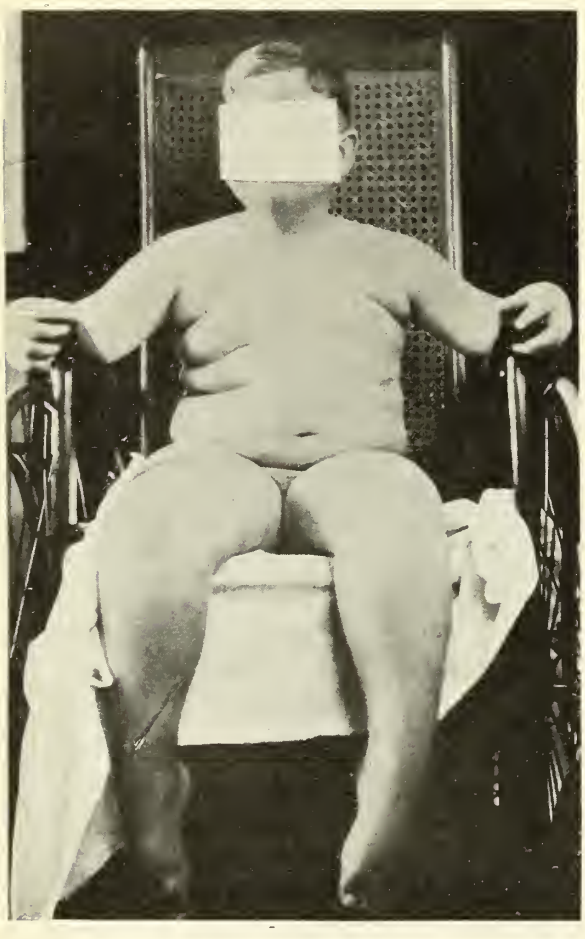
The lesions were cleaned with alcohol and a weak solution of copper and zinc sulphate in saturated camphor. This was applied as a continuous wet pack. The maggots disappeared in two days and the lesions began to heal slowly. After about three weeks granulation tissue was scraped from the wounds and a 25 per cent solution of silver nitrate was applied. This was done several times and little progress was noted. Several lamp therapy treatments were also given, without apparent benefit. At the end of about six weeks the cage was placed over the lower part of the legs so nothing could touch the ulcers, and the wounds were allowed to dry. They improved slowly, with crust formation. Three weeks later, diachylon was applied to soften the crust. When this was removed some epithelial growth was noted. The wounds were clean but not healed. On the whole the progress has been very slow.

*From the dermatological service, Minneapolis General Hospital.

THE ENDOCRINIC TYPE OF MUSCULAR DYSTROPHY: REPORT OF CASE

C. Eugene Riggs, M.D.
St. Paul

Through the courtesy of Dr. Wallace Cole, I had the opportunity of examining J., a boy, 10 years of age. He had whooping-cough at ten months; measles at three and a half years; walked and talked at eighteen months. At five years he became unsteady on his feet, stumbled easily, walked on his toes. Later his parents noticed that the calves of his legs were enlarging—typical tea-kettle calves. Then a marked lordosis became noticeable. Two years and five months after the initial symptoms, his arms were attacked. At present, the trunk muscles are so weak that he cannot sit upright, unaided by his hands.



The onset was as usual, but the rapidity of evolution is exceptional, as the progress of this disease is generally slow. Since the muscular dystrophies resemble in many points the muscular atrophies, at one time they were supposed to be due to a cord lesion. This was before neuropathology had come into its own. The museular dystrophies are "a primary degeneration due to an inherent nutritional weakness of the muscle" (Dana). They are frequently associated with endocrinie defects, but as to the myopathies being due to these, further confirmation is necessary.

I was not allowed to make the metabolic or biochemical blood examination indicated, nor to have radiographs made of the skull nor of the chest for a possible thymus. These findings would have advised us as to the required therapy. In the muscular dystrophies the thyroid, pituitary and thymus gland extracts have been used. There can be no question but that the ductless glands are an important factor in this type of dystrophy. Dr. Timme says that on treatment some of these patients can be kept from deteriorating for years, but that most of them degenerate and become bedridden fairly early. In the muscular dystrophies, the muscles most commonly hypertrophied are the calf muscles, the glutei, the vastus externus, the deltoid, the supra and infra spinati, biceps, the temporal muscles and the tongue. Those usually atrophied are the anterior tibial muscles, the peronei, the flexors of the knee, the lower half of the pectoralis major and the latissimus dorsi. In our patient, because of the endocrine factor, the usual clinical picture is so masked that all boundary lines are lost and the distinction between hypertrophied and atrophied muscles is largely a matter of guess.

The great rolls of flesh on the chest and abdomen are particularly conspieuous.

During my lectures at the University, I taught my students that these patients usually died of an intereurrent disease, in exceptional instances living to be fifty or sixty years of age. We did not know then, as we know now, that in a large proportion of cases there is a persistent thymus, that there are definite lesions in the musculature of the gastro-intestinal tract similar to those found in the skeletal muscles and that there was a myopathic heart; that although the changes in it are milder, yet they are in every way typical of those seen in the muscles. To me at that time, sudden death occurring in the myopathies in the absence of infectious disease, was inexplicable, but with our later knowledge, its avenue of approach—the thymus, the diaphragm, the heart—is clearly apparent.

THE TREATMENT OF PERTUSSIS BY RECTAL INJECTIONS OF ETHER

Fred H. Stangl, M.D.
St. Cloud, Minnesota

After reading the report of Castorina* in 1923, suggesting intramuscular injections of ether in the treatment of pertussis, the method was employed by us with most encouraging results.

One great objection presented itself, namely, the pain of injection in every instance and the occasional necrosis at the site of injection in two instances. This in no way

*Castorina, G.: The Ether Treatment of Whooping Cough. Pediatria 31:151, February, 1924.

detracted from the benefits in reducing the symptoms of pertussis, but made us limit the use of intramuscular injections of ether to the severe cases only. The technic generally used was the daily injection of 1 c.c. of anesthetic ether into the gluteus muscle group and on an average five to six injections were given to each patient.

The publicity given the use of ether in oil for obstetrics suggested this as a means of administering ether in treating patients having pertussis and in September the first patient was seen. This patient had been ill nearly two weeks and the treatment given was one daily injection high into the rectum of one-half ounce of olive oil containing 2 c.c. of anesthetic ether. After the first injection this child's vomiting stopped and there was a reduction of 75 per cent in the paroxysms and sleep was much better. Following the third injection no more paroxysms occurred. Treatment was continued for two weeks and then stopped with the child entirely free from symptoms.

In all, seventeen children have been treated by this method during the past three months and the age has ranged from ten months to seven years. Best results were obtained in children in whom treatment was begun one week after the onset of the disease. Calculating the benefits, definite improvement was observed in 85 per cent of the patients treated. The most striking improvement was the control of vomiting, which was always either entirely controlled or greatly relieved. Next in order, the nights of the patients were more restful and where indifferent benefits were noted, it was in the control of paroxysms.

The technic followed consists in supplying the mother with a bottle of cottonseed oil, having 4 c.c. of anesthetic ether to the ounce, a male urethral catheter and a rubber rectal syringe. The mother is instructed to inject one-half ounce of the oil about 8 or 10 inches up into the rectum once every day, during the late afternoon or early evening. In severe cases a similar injection has been given in the morning. No drowsiness has been noted from the use of ether in these amounts.

CONCLUSIONS

Ether has a very definite benefit in a large percentage of patients suffering from pertussis and has proved much more satisfactory in our hands than treatment with vaccines and all types of medicines given by mouth.

The use of ether as outlined is harmless and the technic of rectal administration is simple.

Ether probably acts as a non-specific remedy by its excretion through the lungs and its presence in the air passages.

Sulphuric or anesthetic ether, therefore, is a valuable addition to our present methods of treating pertussis.

Nephritin.—The present claims for Nephritin appear to be substantially the same as those advanced in 1907 when the Council on Pharmacy and Chemistry in its report, "Reed and Carnrick's Methods," declared this preparation along with others inadmissible to New and Non-official Remedies. (Jour. A. M. A., Dec. 12, 1925, p. 1909.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:
F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH
THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

A PROGRAM OF RESEARCH ON THE ACTION OF LIGHT ON LIVING MATTER: Brian O'Brien (American Review of Tuberculosis, 1925, XI, 486). The principles underlying the physiological action of light have been very little understood and even clinical interpretations on an empirical basis have seldom been accurately drawn. Claims have been, and are being, made for a number of forms of light treatment which have been supported by very little exact data.

In spite of this the possibilities of light treatment cannot well be overlooked. Some very excellent and encouraging results have been obtained, most strikingly, perhaps, in rickets, and notably also in all extrapulmonary forms of tuberculosis, in various nontuberculous skin conditions, and in such systemic infections as osteomyelitis.

In view of this, as well as the many important results being obtained in photochemistry, and the extensive information which light physics is yielding in the field of atomic and molecular structure, there is ample justification for fundamental research in the reactions of life to light.

The writer proposes that the investigations under discussion be limited to the biological effects in the electromagnetic spectrum from short gamma-radiations up to as long wave-length x-radiation as will travel a considerable distance through air (about 20A.), stop here, and take up the electromagnetic spectrum again at 1850A., the shortest ultraviolet that will travel through appreciable air-paths.

For the measurement of the total energy in a light beam, per unit cross-section and unit time, some form of total radiometer is required.

For the dispersion of the light beam and the measurement of wave-length, some form of spectrometer is necessary.

In the x-ray and gamma-ray region the type of measurements (intensity and spectral distribution of energy) is the same as for light, but the methods are somewhat different.

In order that the amount of radiation absorbed at every wave-length may be known, the reflection coefficients and, if the object is at all transparent, the transmission coeffi-

cients must be determined throughout the whole radiation spectrum.

All the foregoing tests must be applied to all of the research proposed in the accompanying outline in order that the optical conditions under which the work is done will be established beyond question.

Having measured the light in the above manner, many details regarding the effects produced must be noted, such as weight change, temperature, basal metabolism, food consumption, excreta and rate, respiration rate, heart rate, blood changes, skin changes, etc.

A. T. Laird, M.D.

LOCAL IMMUNIZATION OF TISSUES OF THE NOSE. THROAT AND EAR BY BACTERIAL VACCINES: Harol M. Hays, M.D., New York (Archives of Otolaryngology, October, 1925, p. 321). The hypodermic injection of vaccines for nose and throat conditions has not been successful. Local application of these vaccines to nasal membranes should appeal to nose and throat men. Prof. Besredka, of the Pasteur Institute of Paris, has prevented typhoid fever in rats by local administration of typhoid vaccine.

METHOD OF PREPARING THE VACCINE

A culture is made with a sterile swab. Cultures are taken from the throat or ear canal or pus from nose or posterior part of nose—and sent at once to the laboratory before drying out, and grown in broth for 48 hours. The bacteria are then killed.

METHOD OF APPLICATION

In nasal conditions: the nasal mucosa is cleaned with hot alkalies, and it is better not to use shrinkage with cocaine or adrenalin. At intervals of three to four days the nose is packed with gauze strips soaked in the vaccine. In ethmoiditis, the pack should be placed between septum and middle turbinate and left in place for one-half hour. In antrum disease, the antrum should be washed and the vaccine injected into the antrum cavity. The patient is also to use vaccine spray twice a day at home. In children the vaccine may be dropped into the nose with a medicine dropper instead of using packing. Throat conditions are not so well treated, because there are no cavities to pack. Ear infections treated by packing canal, and furunculosis and middle ear conditions respond well. Its use in mastoid wound and on packing wick also proved valuable.

All types of cases treated where there was free pus.

Results: 200 cases treated, 61 cured, 92 improved markedly, 10 unimproved and 37 questionable. Sinus conditions did best when suction was used before the application.

CONCLUSIONS

1. Cultures for nose, throat or ear can be readily made.
2. A simple technic without isolation of specific bacteria will produce a practical vaccine.
3. The application of vaccines locally is a painless procedure and acts directly on the tissues infected.
4. The vaccine seems to act more beneficially in purulent conditions which can be reached directly.
5. Nasal sinus infections seem to respond more readily than other conditions.
6. The local application to slow healing wounds, particularly to bone infections, seems to create an antiseptic and stimulating effect.
7. The local application of vaccines can be made in many cases when patients will not submit to hypodermic injections.

Dr. E. L. Armstrong.

SURGERY

SUPERVISORS:

DONALD K. BACON,
LOWRY BLDG., ST. PAUL

VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

THE VALUE OF BLOOD TRANSFUSION IN SURGERY OF THE PROSTATE: Austin I. Dodson (Annals of Surgery, 1925, lxxxii, p. 974). Blood transfusion is a valuable adjunct in the preoperative preparation of patients suffering from prostatic hypertrophy.

In a series of 147 deaths following prostatectomy, Deaver found hemorrhage and shock occupying second and third places as a cause of death. Blood transfusion is most valuable in combating these two complications. The vessels of these old men are sclerotic and they are unable to adjust themselves to the rapid loss of blood. Saline and glucose injections are good for temporary relief but in shock and hemorrhage these fluids are rapidly lost, and then, too, they do not contain the important cellular elements of the blood.

The author feels that the direct transfusion of whole blood is the most efficacious treatment of hemorrhage and shock in the postoperative prostatic patient. Transfusion in all the author's uncomplicated cases in every instance brought about a return of a satisfactory blood pressure and good recovery. He advocates blood grouping as a part of the preoperative preparation for every prostatectomy.

C. S. Williamson, M.D.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS

ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

EXTREME LEUKOCYTOSES IN PERTUSSIS: Roland P. Seitz, M.D. (Amer. Jour. of Diseases of Children, November, 1925). The marked leukocytosis occurring in pertussis is generally recognized and frequently used in the diagnosis of mild and obscure cases of the disease. Meunier made repeated blood counts on 104 cases. The

average of his maximum counts was 27,800 per cubic millimeter, and he obtained 23,700 as the general average at the height of the disease. Several leukocyte counts exceeded 40,000 and the highest noted was one of 51,150.

The highest leukocytoses are usually met with in pertussis-pneumonia. Cabot reports a case of a child, aged 6 years, which had a white blood count of 94,600, of which 69 per cent were lymphocytes. The second case was that of a baby, aged 15 months, where the leukocytes numbered 103,000 and 64.5 per cent of them were lymphocytes.

Cabot also refers to a case of "bronchopneumonia" with paroxysmal cough. A maximum leukocytosis of 227,810; polymorphonuclears. 33.6 per cent, and lymphocytes, 50.2 per cent, was observed.

Reiche mentions a case of pertussis complicated by influenza with a leukocytosis of 172,000; polymorphonuclears 56.3 per cent; lymphocytes 43.6 per cent.

In a survey of the literature, Austrian found leukocytoses in excess of 100,000 reported in the following conditions: multiple carcinoma; gangrenous appendicitis, complicated by hemorrhage from a duodenal ulcer; lobar pneumonia and splenohepatic cirrhosis.

Various explanations are advanced to explain the lymphemia observed. Meunier thinks it is in part due to the extreme congestion of the tracheobronchial lymph glands, and cites as evidence the remarkable multiplication of the lymphogenous cells.

Reiche explains his high count on a basis of the mixed infection. Hess concludes that the lymphocytosis is a secondary mechanical effect, that is, the paroxysms, by increasing intra-abdominal pressure, squeeze lymphocytes out from the spleen and thoracic duct into the circulation.

White blood counts exceeding 100,000 may represent extreme leukocytoses and should not be confused with acute leukemia. In the presence of such large numbers, a careful investigation should be made to rule out pertussis as the primary disease.

The number of blood platelets, nearly always greatly reduced in acute leukemia, is of value in making the differential diagnosis.

R. N. Andrews, M.D.

TRANSFUSION AND INJECTION OF BLOOD IN PEDIATRIC PRACTICE: A. Hymanson, M.D. (Arch. of Ped., July, 1925). Blood injection may be regarded as a substitute for transfusion. The indications for both transfusion and injection have gradually increased in number and variety. Originally the chief, if not sole. indication was hemorrhage, especially in the new-born. Other hemorrhagic conditions that were early agreed upon as indications are purpura and hemophilia. In cases where there has been no great loss of blood, small and repeated transfusions are said to give better results than large ones.

Still another group of cases comprises profound disturbances of nutrition in young infants. A test of a successful transfusion is the change in the color of the child and when the face becomes of pinkish, healthy hue, the operation is to be discontinued. When repeated transfusions are indicated the author advises the use of different donors. In the new-born, a transfusion may vary from 60 to 155 c.c. of blood and in older children up to 500 c.c.

The author states that there is a marked difference between transfusion in the old and transfusion in the very young. In the former it is only a matter of simple addition; but in the infant there is a definite stimulating action on the bone marrow.

In conclusion the author states that transfusion and intramuscular injection of blood have been gradually winning their way as very important additions to our therapeutic armamentarium and that we are learning daily to increase the sphere of their usefulness.

R. N. Andrews, M.D.

ROENTGENOLOGY

SUPERVISORS:
LEO G. RIGLER,
MPLS. GEN'L HOSPITAL, MINNEAPOLIS
A. U. DESJARDINS,
MAYO CLINIC, ROCHESTER

ROENTGEN TREATMENT OF GLANDULAR TUBERCULOSIS: Amundsen (Acta Radiologica, Vol. 4, p. 340, Aug., 1925). The results of treatment in 150 cases of glandular tuberculosis after 2 to 9 years' observation are reported.

The cases are divided into three groups:

1. Simple hypertrophy. There were 81 per cent cured and 9.4 per cent improved.

2. Glandular hypertrophy with periadenitis. There were 49 per cent cured and 35.5 per cent improved.

3. Suppurative glands with fistulæ. There were 77.4 per cent cured and 9.4 per cent improved.

Relapses occurred in 4 per cent of the cases. In 10 per cent there were skin changes due to too persistent treatment of fibrous glands which should be extirpated after they have become entirely quiescent.

Abscesses should be opened and drained before further treatment.

Leo G. Rigler, M.D.

THE ROENTGENOGRAM IN EARLY SCURVY: Pelkan (Am. Jour. Dis. Child., V. 30, p. 174, Aug., 1925). Owing to the vagueness of the symptoms and signs, the clinical diagnosis of scurvy, before hemorrhages have appeared, is somewhat difficult. On the basis of experimental work on guinea pigs and clinical experience with scurvy it is shown that the earliest diagnosis can be made by means of roentgenograms of the joints, particularly the knee joint.

The most important roentgenographic signs in a well developed case are: 1. A finely irregular, broadened, well calcified epiphyseal line. 2. A small spur on the lateral edge of the epiphyseal line with occasionally dislocation of the entire epiphysis. 3. An area of decreased density immediately back of the epiphyseal line. This was for-

merly called the "Trummerfeld zone," but is renamed "scurvy line" by the author because it is the most characteristic bone lesion of scurvy. It is due to a lack of calcification of the newly formed spongiosa. 4. A very thin cortex, often merely a narrow white line. 5. Glass-like transparency of the shaft with loss of trabeculations. 6. A broad, finely irregular, white edge on the epiphyseal center of ossification of the long bones.

Less advanced cases may fail to show the lateral spur of the epiphyseal line. Healing scurvy will show calcifying subperiosteal hemorrhages near the epiphyses.

The above findings are present usually when the clinical diagnosis is quite apparent. In the borderline cases only the broadened epiphyseal line, the dense line around the epiphysis, and the absence of trabeculations in the shaft are present. The diagnosis can be made even though the "scurvy line" be absent.

The ground glass appearance of the shaft is probably the earliest sign and this appearance in the roentgenogram will aid greatly in the early diagnosis of scurvy before symptoms have become prominent.

Leo G. Rigler, M.D.

INTESTINAL DIVERTICULA: Spriggs and Marxer (Quart. Jour. Med., Vol. 19, p. 1, Oct., 1925). This paper is based on the findings in 1,000 consecutive radiological examinations of the alimentary canal, residues of barium having been detected in intestinal diverticula in 143 patients.

(1) Diverticula of the small intestine: These were observed in the duodenum in 38 patients in this series. The routine barium meal was used, and the diverticulum brought into view and its various profiles shown either by rotation of the body or shiftings of the tube. The existence of an accessory pocket was proved by demonstrating with the screen and recording on a film, both during the passage of barium and at a later stage, an opaque residue, after the gut from which it arose is empty.

Authorities have considered these diverticula to be of congenital origin, but the authors are inclined to think that the duodenal pouches are caused by extrusion of those parts of the bowel wall which are weak naturally or made so by ulceration or other pathological processes. The condition is progressive, as is shown by 2 patients who were re-examined after 4 and 7 years respectively, the development of a pouch from a small to a considerable size being observed. In this series there is only one pouch of the first part of the duodenum. The second part is the commonest site, 30 out of the 51 pouches observed being situated there. Small shadows near the ampulla of Vater have often been seen and have been interpreted as opaque food in the papilla. On re-examination after long intervals, the authors are inclined to regard many of these as incipient diverticula.

Diverticula of the jejunum were observed in 7 patients, 4 of these also having pouches in the duodenum. In the ileum, they found only small diverticula varying from a mere pin-head projection to the size of a lentil, these being observed 7 times. These do not appear to be of the same kind as the large pouches seen in the duodenum, but are like the early stage of multiple colic diverticulosis. The appendix was found to be the site of diverticulosis in 6 cases.

(2) Diverticulosis of the large intestine is frequent, having been observed in 100 out of 1,000 cases. The diverticula are small and multiple, and may be found in any part of the colon, but are commonest in the pelvic colon.

A prediverticular state can be recognized radiologically, characterized by fixity of the affected part, with a ragged outline of the wall of the bowel which does not dilate even in the most favorable position. If one aspect only of the wall is involved, the contraction is less marked. These areas are generally small and limited, although the entire colon has been involved in litte patches. It is while this stage of the disease is in progress that the minute herniæ which later constitute the necks of the diverticula, are pushed through. A local pericolic inflammation may simulate this appearance, and must be ruled out in their diagnosis.

At a later stage of the prediverticular state, if a fairly large area is involved, an irregular segmentation, broad and deeply serrated, with narrow haustra, may be observed, and some of the little pockets become visible. These infant diverticula gradually increase in size, and have been observed to increase to a diameter of 5 mm. in one year. The approximate number of developed diverticula is best seen after the evacuation of the opaque meal.

The third stage of diverticulosis is called diverticulitis. Inflammation has now spread from the pouches to the walls of the bowel and surrounding parts. When the area involved is small and more ring-like the appearance is that of a row of slender spikes, parallel or at various angles. These are rigid, and contrast with opposite and adjacent haustra which are overactive in changing their shape. The lumen of the bowel may become occluded as the result of these hypertrophic changes, and subacute or acute obstruction result.

Infectious foci are considered to be the etiological factor. The frequency of location, the symptoms, the treatment, and the prognosis are discussed at length.

Walter H. Ude, M.D.

EYE, EAR, NOSE AND THROAT

SUPERVISORS:
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FIDELITY BLDG., DULUTH

THE ACTION OF THE SOLLUXLAMP IN DISEASES OF THE EYE: Dr. Franz Esser (Deutsche Medizinische Wochenschrift, October 2, 1925, p. 1665). That local heat exerts a favorable influence on many eye diseases is well known. However, there are objections to some of the methods of its application, notably the difficulty of gauging

accurately the intensity of the heat dose, with the consequent danger of a skin burn.

Of the various appliances which have been used, the electric thermophores have been the most pleasant and effective, yet even with these there is danger of a burn, and of inability to regulate the dosage accurately when there are variations in the electric current. These evils seem to be avoided by the use of Dr. Cemach's "Solluxlamp" (made by Quarzlampen-Gesellschaft Hanau a. Main, Germany).

The action of this lamp is purely thermal, since almost all rays of short wave-length are absorbed by means of the attached filter, and only the heat rays of long wave-length become effective. After an irradiation of 10 minutes at 20 cm. a thermometer reads 35° C., at 10 cm., 48° C. There is no rise in the body temperature, that is, the warming effect is essentially superficial.

The lamp may be used by patients in both the sitting and lying positions. The attached color-filters increase its utility for various purposes: The daylight disc makes it purely an illuminating lamp, as for operations; blue-filtered rays, here also available, are credited with an anodyne action; while the red disc makes it a heat-generating mechanism.

Thus far 124 cases have been treated with the Sollux lamp, including, in diminishing number, kerato-conjunctivitis eczematoza, keratitis herpetica, disciformis and parenchymatosa, conjunctivitis catarrhalis, chronic and subacute, iritis, ulcus serpens, ulcus marginale, trachoma, infections after perforating injuries, lime burns, episcleritis, sympathetic ophthalmia, lid abscess, plastic lid operations and acne rosacea. After irradiation all except two cases showed a marked improvement.

Best results were obtained in children with eczematous keratoconjunctivitis, especially in those with severe blepharospasm. Even in cases of the most severe photophobia the lids were spontaneously opened, at times after the very first irradiation, and in all cases after the third or fourth. This result was especially striking in small children, in whom lack of co-operation had previously precluded accurate examination. Adults with painful, irritated eyes were similarly relieved, some becoming actually sleepy. In keratitis parenchymatosa the irradiation seems to increase and hasten new vessel formation. In stubborn cases of chronic conjunctivitis the foreign-body sensation, the burning and the smarting disappeared almost immediately and stayed away for a considerable time. In each case, the usual local measures were employed.

The Solluxlamp is simple to operate. The patient himself can regulate the heat supply by varying the distance between the lamp and the eye. It is advisable to begin with an irradiation of 20 minutes at 20 cm., the daily treatments to be gradually increased to 60 minutes and the distance diminished to 10 cm. Usually one application a day suffices. In resistant cases two treatments daily may be given without untoward result.

VIRGIL J. SCHWARTZ.

VISUAL HALLUCINATIONS IN SANE PEOPLE: Arthur W. Ormond (British Medical Journal, Aug. 29, 1925, p. 376). A considerable number of persons perfectly sound in mind and body, at times perceive images of objects which they do not see, and which, indeed, may not exist. These may take the form of "faces"—comical or grotesque or terrifying—of numbers—of words, complete or incomplete—of lights encircled by areolæ—of moving lines of streaks—of colors—of pictures—of animals, especially if there has been some association with such animals, as for instance, horses, or a deep repugnance for them, as for instance, spiders.

It is important to determine if these hallucinations are to be accounted for by organic pathology in the eye, or by central functional changes. Occasionally retinal, choroidal or arteriosclerotic changes have been demonstrated, but in the great majority of cases no ocular disease could be found. The cause, therefore, is probably an oversensitiveness of certain areas of the brain. Most people can normally visualize accurately—that is, they can form in their minds a definite picture of objects or people, entirely subjectively *but only by mental concentration and for a limited period.* Others have a power and a facility for visualization so strong that they "see" without effort—nay, despite efforts to prevent it—various faces, figures and objects; that is, they have visual hallucinations. This is probably due to a hypersensitiveness of the visual memory centers, such that effects which are ordinarily produced by definite visual stimuli may now occur as a result of aberrant stimuli. These centers and their immediate connections are believed to be in the angular, the inferior parietal and the occipital lobes, not far from the centers for word blindness which are in the left angular gyrus.

Another group of cases may have these "visions" with less facility and distinctness than the above class, but still without concentration or desire to bring them on, and may retain them for a considerable time. This constitutes an intermediate class of moderately hypersensitive centers.

Class I would be, therefore, the severe type—true visual hallucinations.

Class II would be the intermediate type just referred to.

Class III would be the ordinary visualization of normal people.

Class IV is a type wherein persons do not memorize by vision at all, that is, they have weak retentivity.

Class V is the exact opposite of Class I, that is, "word blindness" or "mind blindness" or "letter blindness."

Such persons cannot visualize letters, words or objects no matter how long nor how frequently they may have looked at these. Any of these conditions may be present in people who are perfectly sane and apparently in excellent health.

Treatment is unsatisfactory; tonics, bromides and other general measures may be tried. In the few cases wherein organic ocular pathology can be found, treatment should be directed, of course, at this condition.

VIRGIL J. SCHWARTZ.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

PYGMALION. R. M. Wilson, M.B., Ch.B. 68 pages. Cloth, $1.00. New York: E. P. Dutton & Company, 1925.

THE ART AND PRACTICE OF MEDICAL WRITING. George H. Simmons, M.D., Editor and General Manager Emeritus, American Medical Association, and Morris Fishbein, M.D., Editor, Journal of the American Medical Association, Chicago. 164 pages. Illus. Cloth, $1.50. Chicago: American Medical Association, 1925.

THE SURGERY OF PULMONARY TUBERCULOSIS. John Alexander, B.S., M.A., M.D., Asst. Prof. of Medicine in the University of Michigan, etc., with introductions by Hugh Cabot, M.D., C.M.G., LL.D., F.A.C.S., and Edward Baldwin, M.A., M.D. 356 pages. Illus. Philadelphia and New York: Lea and Febiger. 1925.

ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE OF THE UNITED STATES. 314 pages. Illus. Washington: Government Printing Office, 1925.

THE SURGERY OF PULMONARY TUBERCULOSIS. By John Alexander, M.D., with introductions by Hugh Cabot, M.D., and Edward R. Baldwin, M.D. Octavo, 356 pages with 53 engravings and 12 plates. Philadelphia. Lea and Febiger, 1925.

This book fills a genuine need which has been sharply realized by physicians interested in securing accurate information regarding the much heralded resources of surgery in the treatment of certain cases of advanced pulmonary tuberculosis. The author's own experience in such procedures and all the work along these lines that is being done in this country and Europe are summarized fully and clearly. The bibliography includes five hundred references. Dr. Alexander has performed a most valuable and timely service in demonstrating to the profession, under extraordinary difficulties, the value of a new resource in the treatment of tuberculosis.

A. T. LAIRD, M.D.

THE NORMAL DIET. W. D. Sansum, M.D. C. V. Mosby.

This compact volume contains a concise discussion of food requirements and of a number of questions having to do with metabolism. The terminology is simple and plain. The author discusses food requirements and touches on the accessory food factors. He also briefly discusses acid and alkaline foods.

L. R. CRITCHFIELD, M.D.

GOOD LOCATION FOR PHYSICIAN IN NORTH DAKOTA—House and office in connection, for sale in a town of 500, central to four other towns without a physician, and in best section of Red River Valley; 40 minutes' drive to excellent hospital facilities; no competition; wide territory. Price and terms reasonable. Am leaving to join clinic. Address C-73, care MINNESOTA MEDICINE.

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PHYSICIAN, 33, well trained in Gynecology, some Surgery, graduated from Germany, U. S. A. license, good manners, wants to associate with elder colleague, preferably surgeon, or to buy a city practice after introduction. Speaks German, Spanish and French. Address C-66, care MINNESOTA MEDICINE.

EXPERIENCED LABORATORY TECHNICIAN desires position in Twin Cities or vicinity. Address C-72, care MINNESOTA MEDICINE.

YOUNG WOMAN, twenty years of age, graduate of South High School, Minneapolis, wishes clerical position or that as assistant in doctor's or dentist's office. One year's training in Minneapolis hospital. Address C-70, care MINNESOTA MEDICINE.

FOR SALE—Wappler E-Xell diathermy and large rotary converter, used four months. Reason for selling, formed partnership duplicating this machine. Can buy one or both. Address C-71, care MINNESOTA MEDICINE.

POSITION WANTED—By young woman who is a registered radiological technician, clinical laboratory technician and registered trained nurse. Excellent references. Address C-74, care MINNESOTA MEDICINE.

WANTED—Well qualified eye, ear, nose and throat man, good refractionist and operator, wants assistantship or location. Gentile, Protestant, excellent references. Address C-68, care MINNESOTA MEDICINE.

WANTED—Position as secretary-stenographer in hospital clinic or doctor's office. Five years' experience in medical and surgical dictation. Best of references. Write Nella H. Rokke, Warren, Minn.

FOR SALE—Haldane Basal Metabolism Apparatus, three unit, complete with tank and electric motor, in excellent condition. Price $125.00. Address C-65, care MINNESOTA MEDICINE.

WANTED—A Pediatrician and an Aurist and Oculist to be associated in a Minneapolis Clinic. Address XYZ, care MINNESOTA MEDICINE.

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INTESTINAL TUBERCULOSIS *

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Some years ago Osler gave us this statement, "No disease illustrates more forcefully the slow but sure advance of science, nor the practical application of science for the betterment of mankind than does the study of the history of tuberculosis."[1] Another chapter has been added to that history. It is the chapter concerning intestinal tuberculosis. This complication, until a few years ago, was considered a fatal one, but during the last few years much has been learned about it, especially with regard to diagnosis and prognosis.

Intestinal tuberculosis may occur as a primary disease, but is much more frequently found as a secondary manifestation to pulmonary tuberculosis. We have found it complicating pulmonary tuberculosis in 33.23 per cent of our cases. Many of the 385 patients studied were studied because of symptoms referable to the intestinal tract and it is felt that 20 per cent represents the more exact proportion of our cases who have intestinal complications.

Pathology.—The site of predilection of intestinal tuberculosis is in the ileo-cecal area. With this as the starting point, the pathology may extend both ways, although the progress along the larger bowel is more usual than along the smaller bowel. Direct contact with swallowed bacilli perhaps best explains the origin of the ulceration, but hematogenous and lymphatic origin cannot be definitely ruled out.

Stengle divides this condition into three types: the ulcerative, hyperplastic and stenotic. The first two, alone or combined, were the types which we encountered, with the ulcerative the more common and the easier to diagnose.

Symptomatology.—Patients with intestinal tuberculosis present a variety of symptoms, all of which may be referable to the gastrointestinal tract. There are no specific symptoms or any combination of symptoms which are particularly characteristic of intestinal tuberculosis. This is not at all surprising when one considers that the lesion may be found in any part of the intestines or in scattered areas of the intestines; likewise, that the lesion may be found in any of the various stages of healing or ulceration. These symptoms are: nausea, vomiting, anorexia, pain, gas, abdominal distress, pyrosis, constipation, and diarrhea. Loss of weight, fever, and tachycardia are also frequently associated with intestinal tuberculosis. One or two of these symptoms deserve further consideration: abdominal distress, which is particularly common



Fig. 1. Barium meal: Six hours. Marked hypermotility, the barium appearing ragged in the sigmoid, cecum and ascending colon.

and is vaguely and variously described by different patients. This distress does not usually come on until an hour or two after eating, and remains until the next meal, being relieved by food. Pain, which is a late sign, is experienced by practically all of our people. As a rule, it is not localized and may shift from place to place. It not infrequently appears directly after meals and we find our patients

*Read before the Hennepin County Medical Society, at Glen Lake Sanatorium, Oak Terrace, Minn., June 8, 1925.

abstaining from food rather than suffer the pain. Again, it may come on from one to two hours after eating and be relieved only by evacuation of the bowels. Pyrosis is experienced by many. Constipation and diarrhea were formerly considered grounds for the diagnosis of enterocolitis, especially if they alternated. We now know that these are late symptoms, with only severe diarrhea as a later one. Constipation is usually an early symptom, although it may supplant severe diarrhea at the last. Archibald[2] felt that diarrhea was indicative of ulceration of the large bowel, while constipation was evidence of disease of the small bowel. This, however, we have not been able to verify.

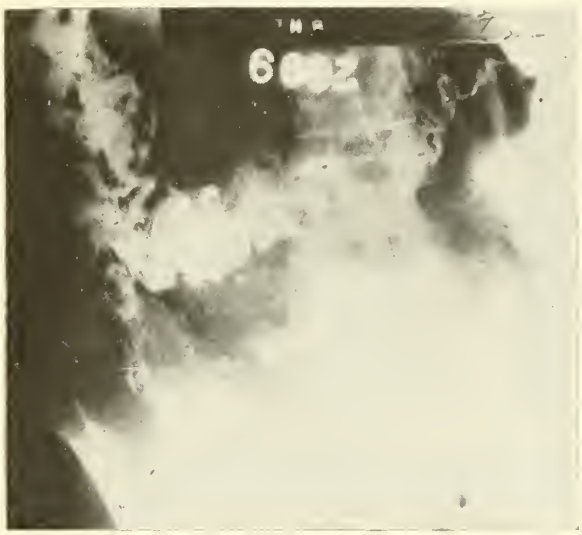


Fig. 2. Barium meal: Seven hours. Cecum and ascending colon more ragged than at six hours.

Diagnosis.—The pathological diagnosis and clinical diagnosis are quite at variance in intestinal tuberculosis as in many other diseases. The pathologists find from 56 to 92 per cent (majority 60 to 70 per cent) of people dying from tuberculosis with intestinal lesions. There are several reasons for this difference: (1) the pathologist deals with lethal tuberculosis; (2) extensive ulcerations of the mucosa are often found without any symptoms having been apparent during life; (3) radiographically, we are dealing with a hollow organ and are only seeing it in one plane. Then again, we are as yet only able to diagnose the disease when it is located in the large intestines and even though the cecum is the site of predilection, Schwaatt[3] found, in his pathological study of 199 cases, the large bowel involved alone in eighteen cases, the small bowel alone in thirty.

Physical examination gives us little or nothing in the most common type of disease, the ulcerative, unless it be tenderness. In the hypertrophic type, there may be a palpable mass over the cecum or other areas.

The sigmoidoscopic examination is of help in an occasional case, particularly where the ulcers are low down.

The finding of tubercle bacilli in the feces of patients who have no pulmonary tuberculosis, or from patients whose sputum shows no evidence of the germ, is of decided help. One should not rely wholly upon microscopical evidence but should resort to guinea pig inoculation in these cases.

The greatest reliance in making a diagnosis of intestinal tuberculosis, therefore, has to be placed on the *x*-ray examination, the following details of which have been followed in our hospital: The patient comes to the fluoroscopic room at 9 A. M. for his barium meal, having previously had no breakfast unless it be a bit of toast and coffee. At this time, the esophagus and stomach are carefully studied. We are careful that no cathartic is given for at least two days prior to this examination.

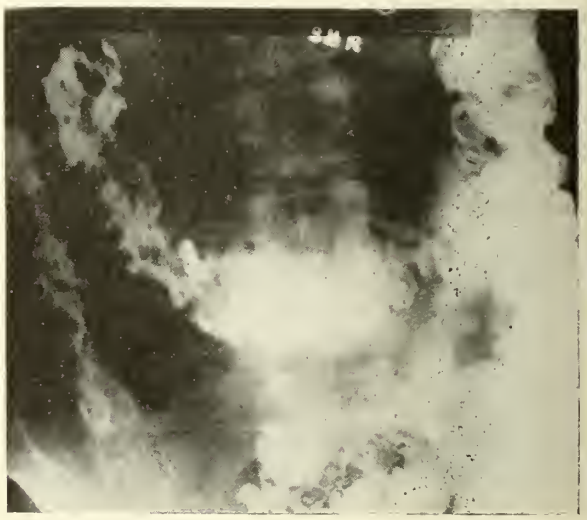


Fig. 3. Barium meal: Eight hours. Cecum, ascending colon and first part of the transverse colon very ragged.

Fluoroscopic observations and films are made again at the sixth, seventh, eighth, and possibly ninth hours. The motility is noted at all observations and particular attention is given to raggedness and filling defects if found in the same area

in all the observations. We feel that one is fairly safe in venturing a diagnosis of intestinal tuberculosis *if* the patient has pulmonary tuberculosis. Observation is also made at the twenty-fourth hour. The defects are most frequently seen at the cecum and ascending colon. (See illustrations.)

After the barium meal has been entirely expelled, a barium enema is given under low pressure and this in the cases with extensive ulceration usually corroborates what has already gone before, showing irregularity along the colon, especially in the cecum and ascending colon. The cecum does not fill out in the full round manner normally seen and one of our most common findings is a "spitting" of the barium analward from the cecum or ascending colon to the hepatic flexure, or mid-transverse colon. However, more reliance should be placed on the observations of the meal than upon those of the enema.

Prognosis.—In 1920 we studied a few of our patients in this manner, but in reviewing those cases now we find that their incompleteness makes it impossible to make any accurate diagnosis. One patient, however, so examined at that time and



Fig. 4. Barium meal: Twenty-four hours. Cecum, ascending and transverse colon show only a faint trace of barium.

proved by operation for appendicitis the same year, is alive and has been working for the past three and a half years. Several of the patients diagnosed by us in 1922 are alive and many are working. Had we said ten years ago that there was a possibility of an individual with intestinal tuberculosis living three to five years, our judgment would have been severely questioned.

Treatment.—We have endeavored to treat our patients with open mind, feeling that intestinal

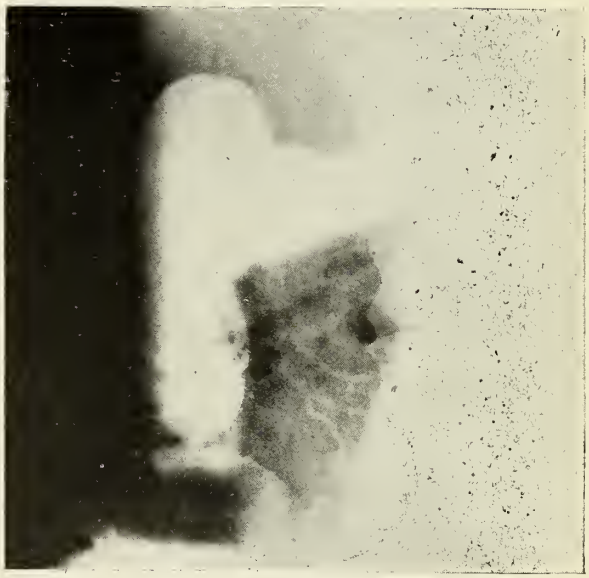


Fig. 5. Barium enema filled the colon with ease but encountered a filling defect at the cecum. Barium was immediately spat analward to the mid-transverse colon.

tuberculosis, like tuberculosis of other parts, is characterized by remissions and exacerbations and some of the apparently good results obtained by this or that treatment might be due simply to a remission of the disease. There, however, is a strong feeling among physicians throughout the country and among patients in our hospital that the Quartz Mercury Vapor lamp is almost a specific, and there are grounds for that belief. Take, for instance, six of our patients diagnosed early in March of this year, who were all treated similarly, that is, with local radiations over the abdomen. Four of these patients were symptom-free in fifteen days. The fifth one was symptom-free after six weeks and has remained so since. The sixth patient received no beneficial results, and it was finally necessary to discontinue the lamp and treat him by dietary methods. Objectively, however, the results were not as marked.

Another large group of our patients we have treated by dietary measures, beginning by two ounces of milk and two ounces of cream every hour and gradually increasing the amount and quality of food as in the Sippy diet, omitting, of course,

the powder. This milk and cream regime was followed until the patients were on a fairly liberal diet comparatively free from cellulose. The results in this group have been quite satisfactory, there being almost an immediate cessation of pain after the milk and cream were started.

A combination of the above treatment has been necessary in some cases.

Heliotherapy gives results comparable to actinotherapy.

Surgery is advocated by some but none of our patients have been thus treated.

BIBLIOGRAPHY

1. Osler, William: Historical sketch—Klebs tuberculosis. 1909.
2. Archibald, E. W.: The surgical treatment of ulcerative intestinal tuberculosis as occurring chiefly in the course of pulmonary tuberculosis. Can. Med. Assn. Jour., Sept., 1920.
3. Schwatt, H.: Tuberculosis of intestines. Am. Rev. Tuberc., viii, 9.

One day, going with George Ross through Bedlam, Dr. Savage, at that time the physician in charge, remarked upon two great groups of patients—those who were depressed in the morning and those who were cheerful; and he suggested that the spirits rose and fell with the bodily temperature—those with very low morning temperatures were depressed, and vice versa. This, I believe, expresses a truth which may explain the extraordinary difference in the habits of students in this matter of the time at which the best work can be done. Outside of the asylum there are also the two great types, the student-lark who loves to see the sun rise, who comes to breakfast with a cheerful morning face, never so "fit" as at 6 A. M. We all know the type. What a contrast to the student-owl with his saturnine morning face, thoroughly unhappy, cheated by the wretched breakfast-bell of the two best hours of the day for sleep; no appetite, and permeated with an unspeakable hostility to his vis-a-vis, whose morning garrulity and good humor are equally offensive. Only gradually, as the day wears on and his temperature rises, does he become endurable to himself and to others. But see him really awake at 10 P. M.! While the plethoric lark is in hopeless coma over his books, from which it is hard to rouse him sufficiently to get his boots off for bed, our lean owl-friend, Saturn no longer in the ascendant, with bright eyes and cheery face, is ready for four hours of anything you wish—deep study, or "Heart affluence in discursive talk," and by 2 A. M. he will undertake to unsphere the spirit of Plato. In neither a virtue, in neither a fault; we must recognize these two types of students, differently constituted owing possibly—though I have but little evidence for the belief—to thermal peculiarities.—"*The Student Life*" in "*Aequanimitas*"—William Osler.

INDICATIONS FOR ARTIFICIAL PNEUMOTHORAX *

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The indications for pneumothorax are twofold: those that concern the diseased lung itself, and those that concern the contralateral lung together with tuberculous or non-tuberculous pathological conditions in other parts of the body.

Those concerning the more diseased lung have to do with the extent and type of involvement and the presence of hemorrhage. Early or incipient cases are not considered among those which should have pneumothorax. Reports have appeared in the literature on the use of pneumothorax in early cases, but they are not convincing. Collapsing the lung does not cure the patient's tuberculosis, but merely places the lung at rest and allows healing to proceed more rapidly. It does not, therefore, obviate a period of rest treatment. With a false sense of security from the pneumothorax treatment, the importance of taking the proper amount of rest is with difficulty impressed upon the patient. Some may say that in our cases the treatment was not started early enough, but since such a large number of pulmonary cases recover without the use of pneumothorax, we feel that the usual conservative treatment should first be given a trial.

The duration of pneumothorax treatment must be considered in years rather than in months, and this factor must be taken into account in starting treatment in relatively early and even in the more advanced cases where the patient is doing well.

There are certain complications which accompany pneumothorax, and these also must be taken into account in instituting treatment. Fluid occurs very frequently, in 50 to 100 per cent of all cases, depending on how long the treatment is continued. Other less frequent complications are empyema, subcutaneous emphysema, spontaneous pneumothorax and air embolism. Any one of these complications may influence the course of the disease unfavorably. Hemorrhage may be an indication in early involvement but these cases are exceptional. The indications for inducing pneumothorax in our series are given in Table 1. Extensive involvement

*Read before the Hennepin County Medical Society at Glen Lake Sanatorium, Oak Terrace, Minn., June 8, 1925.

with or without cavity leads the list, while its use for the control of hemorrhage is one of the least frequent indications. Large cavities are in themselves indications of treatment if there are no contraindications. Extension of the disease is likewise an indication. It has been observed here that the results of compression are not as good in acutely diseased lungs as in the more chronic types.

Any one of the above conditions may be present and still pneumothorax be impossible because of involvement in the contralateral lung. A case requires careful study before treatment is started to determine whether there is any trouble in the contralateral lung. Ideally the opposite lung should be entirely clear both by *x*-ray and physical signs. As is seen by Table 2 the contralateral lung has been clear in 27 per cent of our cases while in the group under treatment at the present time it is entirely clear in 43.5 per cent, indicating a more careful selection of cases. In determining the condition of the contralateral lung the *x*-ray is absolutely essential. Many cases which have no definite physical signs show the presence of infiltration.

TABLE I

Indications for Collapsing Lung—	No.	Per Cent
Extensive involvement (with or without cavity)	61	41
Extension of disease	26	17
No improvement	24	16
Treatment began before entrance	17	11
Hemorrhage	15	10
Air to replace fluid	7	5
Total	150	

Our experience has been that unless there is evidence of definite fibrosis, the danger of the lesion becoming activated by pneumothorax is very real. The opinion of our roentgenologist is obtained in all cases. There are a few exceptional cases in which the physical signs tend to clear up with the collapse of the more extensively diseased lung. In general it may be said that signs of activity in the good lung on physical examination, or a recent parenchymal lesion as seen by *x*-ray but without physical signs, is a contraindication for collapsing the more extensively involved lung. In a limited number of cases bilateral pneumothorax has definite value. Better results are seen in those cases in which a unilateral collapse has been established for some time and in which the collapse is only partial because of adhesions. In such a case, if extension occurs in the relatively good lung, bilateral pneumothorax may be considered. In the presence of complete collapse of one lung, bilateral pneumothorax is dangerous because by spontaneous or accidental means the complete collapse may occur in the other lung also. Bilateral pneumothorax has been done in twelve cases in our series and in three of these directly for the control of hemorrhage. In six of the twelve cases, very definite benefits have been noted.

Tuberculous complications are in themselves no longer considered a contraindication to artificial pneumothorax. They may, however, indicate such widespread disease that pneumothorax will be of no benefit. A tuberculous enteritis, formerly considered as a contraindication, should be better able to respond to treatment with the diseased area in the lung placed at rest.

Since pneumothorax may throw an extra burden on the heart, any diseased condition of the heart, blood vessels, or kidneys may in general be considered a contraindication to pneumothorax.

TABLE II

Contralateral Lung (*X*-ray)—	No.	Per Cent
Entirely clear	41	27
Fibroid tuberculosis	59	39
Fibroid parenchymal	42	28
Calcified tuberculosis	5	3
Peribronchial	3	2
Total	150	

CONCLUSIONS

1. Pneumothorax should not be considered in early cases except for certain special indications.
2. The length of time necessary for treatment and the complications which are apt to occur are the main arguments against pneumothorax in early cases.
3. The results of compression are not as good in acutely involved lungs as in the more chronic type.
4. Recent infiltration in the contralateral lung determined either by physical signs or *x*-ray is a contraindication to artificial pneumothorax.
5. Bilateral pneumothorax is of value in a few carefully selected cases.
6. Tuberculous complications in other parts of the body are not as a rule contraindications to pneumothorax.
7. Disease of the heart, vessels, or kidneys may be a contraindication to pneumothorax.

DIFFERENTIAL DIAGNOSIS OF PULMONARY TUBERCULOSIS *

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In the accompanying chart (Fig. 1) are presented the essential points in the differential diagnosis between lobar pneumonia, bronchopneumonia, bronchiectasis, asthma and tuberculosis. It is not my intention to discuss the differential diagnosis in detail, but rather to point out how tuberculosis may simulate any one of them.

Tuberculosis may at times appear very much like lobar pneumonia. Osler reports the case of a cab driver, who, after a night of exposure, was taken with a sudden chill. He was brought to the University Hospital at Philadelphia and five days later was made the object of a student clinic. Osler says that at that time there was wanting nothing in onset, symptoms, findings, etc., to make it a typical case of lobar pneumonia. It was not until ten days later that the tubercle bacillus was discovered in the sputum and the true nature of the case revealed.

Disease	Onset	Symptoms	Findings	Excretions	Blood
Lobar Pneumonia	Sudden chill Rigor	High fever — more or less constant Rapid Respiration Rapid Pulse Dry cough Thoracic pain	Aspect anxious Cyanosis Herpes Chest — Distant breath, fine crepitations replaced by dullness and tubular breathing Later coarser rales	Sputum — rusty, transparent, homogeneous, extremely tenacious Urine — Reduced high specific gravity Trace of Albumen Absence of Chlorides	Leucocytosis 15,000 to 30,000
Broncho-Pneumonia	Primary in infancy onset like Lobar Secondary to some infectious disease Onset gradual	Fever is variable Pulse and respiration increased Cough dry and hard Thoracic pain is usually absent	At onset there may be no abnormal findings Dullness at base with rales Cyanosis	Sputum — thin mucus, mucopurulent — Occasional blood streaks	Leucocytosis less marked
Bronchiectasis	Gradual — From a variety of causes, pneumonia, dust, etc.	Paroxysms of cough Loss of strength Periods of Fever Night-sweats	Chest — varies — usually dull at base with moist crepitant rales Clubbing of Fingers	Sputum — very large amounts, ℥xx in 24 hours Fetid odor	Nothing characteristic
Asthma	Gradual	Paroxysms of Dyspnoea Cough Expectoration No Fever	Chest — Percussion note is normal or hyperresonant Auscultation gives whistling rales and rhonchi	Sputum — greyish pellets Thin at times Blood-streaked at times Curschmans spirals	Eosinophilia
Tuberculosis	Onset varies May resemble anything Often gradual	Loss of strength Loss of endurance Loss of weight Fever High pulse Night-sweats Cough	Usually some impairment of resonance at apices Increased breath-sounds Fine rales There may be no findings	Sputum — whitish elastic fibers Tubercle bacillus	Nothing characteristic Leucocytosis if about 12,000 or more

Fig. 1.

In our own experience at the sanatorium, we have found instances where relapses of tuberculosis simulate lobar pneumonia. One of our patients developed a lobar pneumonia with a typical febrile course which terminated fatally. At autopsy there were no signs of tuberculosis. Another patient entered the sanatorium with a moderate amount of tuberculous involvement in the right apex and a slight amount in the left. Her prognosis seemed favorable and the summer of 1924 found her an ambulant patient and doing very well. On August 29th, she was taken sick suddenly with a chill and in a day or two her temperature rose and maintained a level much like that of lobar pneumonia. At this time the findings were dullness at the right base posteriorly, with showers of fine crepitant râles at the end of inspiration. Lobar pneumonia was suspected, but as time went on, it became apparent that we were dealing with a massive tuberculous infiltration. Figure 2 shows the roentgenogram of our case before the acute exacerbation, and Figure 3, the picture after the exacerbation.

Tuberculosis is often diagnosed as bronchopneumonia. Of the 540 adults present in the hospital at the date of this paper, fifty-nine gave a

*Presented before the Hennepin County Medical Society at Glen Lake Sanatorium, Oak Terrace, Minn., June 8, 1925.

history of having had some form of pneumonia from two to three years before the diagnosis of tuberculosis was made, with the further history of never having completely recovered from this pneumonia. Five more patients gave the same history, except that the date of the pneumonia extended back three to five years. Six more patients gave a history of having had a diagnosis of tuberculosis which later was reversed by another doctor, who called it pneumonia. Time, however, proved that the first diagnosis was correct. Bronchopneumonia, except in infancy, is generally secondary to some infectious disease. Tuberculosis should always be suspected, and if the findings are at the apices, the doctor should consider it tuberculosis unless proven otherwise.

Bronchiectasis is a dilatation of the small bronchi of the lung. We find it in a variety of diseases or following a variety of causes. Once established, it seems to constitute a clinical entity, even after the original cause has been removed. It is very easy to confuse bronchiectasis and tuberculosis. The outstanding symptoms are paroxysms of cough, loss of strength, loss of weight, periods of fever, night sweats. These will easily bring tuberculosis to mind. In fact, the error here is usually on the other side; that is, a diagnosis of tuberculosis is

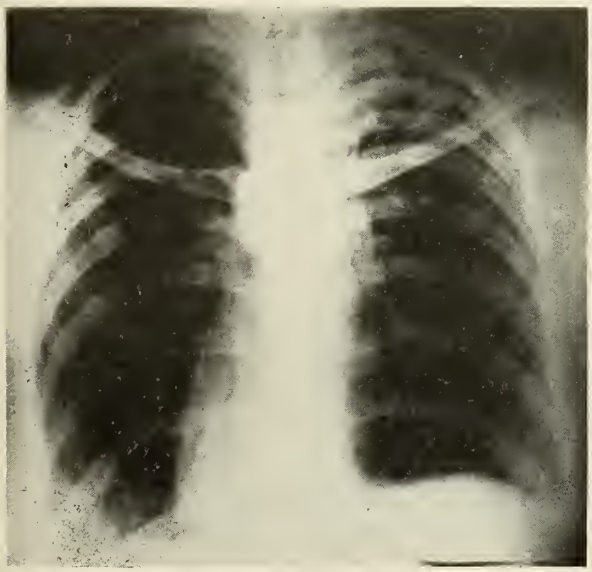


Fig. 2.

more often made in a case of bronchiectasis than a diagnosis of bronchiectasis in a case of tuberculosis. In about three years there have been discharged from the Glen Lake Sanatorium some thirty cases of bronchiectasis. They have entered with a diagnosis of tuberculosis. After a prolonged study consisting of repeated physical examinations, several *x*-ray plates, inoculation of sputum in guinea

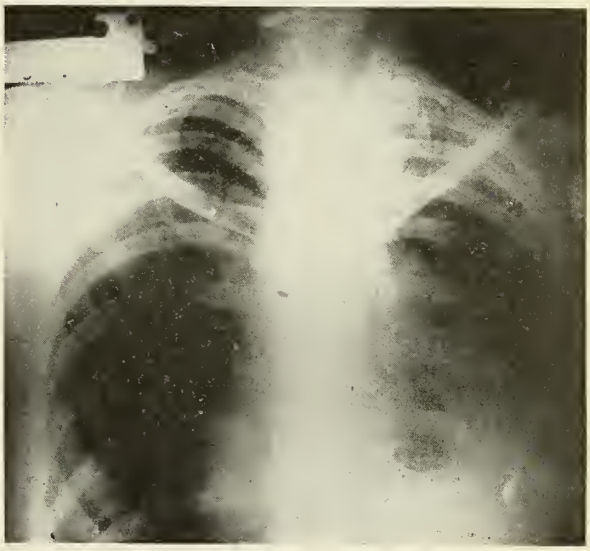


Fig. 3.

pigs and of diagnostic courses of tuberculin, they have been found to be non-tuberculous.

The old idea of bronchial asthma in relationship to tuberculosis was that the two were never coexistent. The incidence of asthma in tuberculosis is perhaps not very great. However, Dr. J. J. Mendelsohn, physician in charge of the Stock Yards Dispensary, in Chicago, states that every asthmatic should be considered a potential case of pulmonary tuberculosis. Sputum should be examined frequently for the presence of tubercle bacilli. We have at the sanatorium at present about six cases of asthma out of a total number of 540 adult patients. One of these patients had asthma fifteen years before tuberculosis was diagnosed. Another had asthma seven years previous to the tuberculosis. Two of the patients seemed to have developed asthmatic symptoms after their onset of tuberculosis. During the last three years we have discharged four patients with a diagnosis of asthma who were admitted with a diagnosis of tuberculosis. One of these gave a history of slight elevation of afternoon temperature for several months. Physical examination and *x*-ray failed to reveal tuberculosis. Careful search for focal infection was made and abscessed teeth were found. Removal of the abscessed teeth brought on a cessation

of afternoon temperature. The patient was then put through a diagnostic course of tuberculin with negative results. She was finally discharged as non-tuberculous and during the eight months that she has been out of the institution has been doing very well.

Many cases need very careful study before a diagnosis of tuberculosis can be made or before it can be ruled out. The onset varies. Dr. Harold E. Robertson, speaking from the standpoint of pathology, once said, "Tuberculosis may resemble anything under the sun." That statement also holds true clinically. The symptoms are listed as loss of strength, loss of endurance, loss of weight, fever, high pulse, night sweats, cough, expectoration, hemorrhages, etc. The findings usually are impairment of resonance at the apices, increase in transmission of breath and voice sounds and fine râles after coughing; but there may be absolutely no physical findings and the symptoms may be very slight. Sputum may be absent or if present contain no tubercle bacilli. When we find such a case, it certainly taxes our utmost resources in arriving at a definite conclusion. Frequent examinations, repeated stereoscopic chest plates, inoculation of guinea pig with the sputum and a diagnostic course of tuberculin are all usually necessary. It sometimes requires several weeks of careful observation to determine the diagnosis. In view of the importance of a correct diagnosis to the patient, nothing should be left undone which might help to establish definitely the presence or absence of tuberculosis. There is a danger of depending too much on *x*-ray. Cabot says that, "as often as not, your *x*-ray leads you astray when it comes to diagnosis of incipient tuberculosis." In respect to the diagnostic course of tuberculin, we feel that a systemic reaction from less than 10 mg. of Koch's old tuberculin is of some significance. In a few instances where this has occurred, we have found, by gastro-intestinal study, involvement of the cecum where we have been unable to find any tuberculosis in the chest.

To recapitulate, tuberculosis may resemble a great variety of diseases, and it may give very slight evidence of its presence. The possibility of tuberculosis should always be borne in mind. Neither should a positive diagnosis be made nor should tuberculosis be excluded until a careful, painstaking study of the case has been made.

HELIOTHERAPY IN TUBERCULOSIS*

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Heliotherapy, as a conservative method for treating tuberculosis as promulgated by Rollier, has held the spotlight of public opinion for nearly twenty-five years. Some of his theories regarding heliotherapy have been disputed, especially the one regarding the rheostatic function of the tanned skin in converting the short ultra-violet rays into long ones. Whatever individual contentions may be regarding the action of the skin, or the physiology of light, we cannot fail to recognize the fact that heliotherapy is probably one of the greatest beneficial agents ever advocated or used in the treatment of all forms of tuberculosis.

Primarily, insolation was intended as a remedy for treating bone and joint tuberculosis, but as these conditions were usually associated with other types of the disease and they likewise responded, its usefulness was extended to embrace tuberculosis in all its forms. Today, heliotherapy is a remedy to be used in all types of tuberculosis and its efficiency lies not in the type of tuberculosis, but in its method of use. There are certain definite limitations to its use, and the idea of using it as a panacea in treatment is apt to make its use empirical.

If you should ask the various heliotherapists what the indications are for giving heliotherapy in tuberculosis, undoubtedly the reasons given would not be very tangible. In giving heliotherapy, there should be some definite indications, some concrete principles, by which each one could say that he is getting heliotherapy for a particular reason, and not for the blanket reason that it is good for surgical tuberculosis.

The first question put to me by the medical student is: "What are the indications for heliotherapy?"

Instead of classifying the indications for heliotherapy, I would rather classify the contraindications and they are:

1. Moribund patients.
2. Patients who do not respond favorably to the treatment.
3. Individuals with unstable nervous systems.

*Read before the Hennepin County Medical Society at Glen Lake Sanatorium, Oak Terrace, Minn., June 8, 1925, and at the annual meeting of the American Sanatorium Association, Glen Lake Sanatorium, Oak Terrace, Minn., June 16, 1925.

There is no way of determining the type of case to select for heliotherapy, because no one can tell which will respond favorably and which unfavorably. From my experience, the unfavorable case (except the moribund case) is the one which does not react favorably while undergoing sun cure. One individual with slight pulmonary tuberculosis and a laryngeal involvement may run a rapid fatal course and finally succumb to the disease in spite of heliotherapy, while another with massive infection and laryngeal involvement become quiescent and even arrested. Some have a violent reaction to sun, while others are able to take long hours of sun cure without any reaction whatsoever.

I do not advocate giving all far advanced cases of pulmonary tuberculosis heliotherapy, but I do, in selected cases, advocate giving it a trial. In this institution, where nearly all of our surgical cases have a far advanced pulmonary lesion and some have cavity formation, no special attention is paid to the pulmonary involvement and the symptoms attributed to the lung, such as cough, expectoration, and the symptoms of toxemia all clear up.

Occasionally a patient has a hemorrhage. He is immediately taken off sun treatment and after a period of time put back on again.

During the years from its inception in 1903, by Rollier, to 1916, it was known that there was a place in Switzerland where tuberculosis was being treated by heliotherapy. In 1916, a symposium by Hyde and LoGrasso stimulated this work in America until today a sanatorium treating tuberculosis, especially extra-pulmonary tuberculosis, without heliotherapy is as passé as one not utilizing pneumothorax and thoracoplasty in the treatment of the disease.

In the treatment of extra-pulmonary tuberculosis it must be remembered that it is not the bone or joint alone that is sick, but the individual himself, and the bone or joint disease is merely a localization of a general constitutional disease. So in the treatment, the idea uppermost in our minds is that we are treating an individual who has tuberculosis.

The majority of extra-pulmonary cases of tuberculosis which come to the sanatorium for treatment are not picked cases or early cases, but rather the advanced cases who have had the usual modes of treatment and are transferred from other hospitals where they had the best medical and surgical care obtainable, but because of the ward arrangement or hospital construction, it was impossible to give sun cure. These individuals do or did not get well. They gradually, but surely, declined. Upon admittance to the sanatorium, the only additional treatment was heliotherapy, properly supervised, and the opposite results began to take place. Instead of a gradual decline, steady and rapid improvement began to take place. When the above is taken into consideration and properly weighed, it certainly is reasonable to assume that the thing which was lacking in the first treatment was the element of sunlight.

Giving heliotherapy does not mean merely turning a patient out into the sun; it means the proper and systematic exposure, step by step, each step watched and guarded. In bone and joint cases, orthopedic sense is applied to heliotherapy. When we consider that heliotherapy has a similar effect upon the individual as exercise, it behooves us to be careful in administering the treatment.

How the beneficial effect of the sun is obtained and what it is due to has been widely discussed and there is a divergency of opinion regarding it. We know that the beneficial effect obtained is in direct proportion to the individual's ability to produce a tan, and in such patients as the high-typed blondes, the red-haired individuals who would not tan, various methods were used to aid in the tanning, such as a diet of green vegetables rich in vitamines, drugs such as resorcinal, eosin and cod liver oil, to aid in the process.

The fact that some individuals tan and others do not, and that those individuals with a tanned skin get well, while those who do not tan are slow in making headway, makes me believe that the tanning of the skin acts as something other than a rheostat for the conversion of short ulta-violet rays into long ones. I know that the majority of you will not agree with me when I state that I believe that in dealing with the skin we are probably dealing with a ductless gland and the skin has some function similar to the organs of internal secretion, and the ability to tan depends upon the sun's ability to stimulate this gland.

A patient enters the sanatorium and after a period of observation he takes the initial sunbath, and as insolation goes on, his color changes from a sickly pale color to a slight erythema, then a brown color and finally a deep mahogany brown. Along with this, going hand in hand, is the drop in temperature, the slowing of the pulse, cessation

of pain, restful sleep, increased appetite, gain in weight, and instead of being a morose, unhappy individual, he becomes a contented, robust individual with a bright outlook upon life.

It was supposed that in order to obtain good results in sun cure, high altitudes were necessary. True, high altitudes are desired, but not always obtainable, and there are many advantages to be had, such as purer air, air free from dust and smoke, and the higher the altitude, the more ultra-violet rays. But good results can be obtained in low altitudes, especially if heliotherapy is practiced early in the day, in spite of the slanting rays of the sun. Then the therapeutic efficacy of the sun is at its highest point. In the early morning the air is free from dust and smoke. Ultra-violet radiation from the sun is supported by the ultra-violet radiation from the sky, and principally the harmful effect from the heat rays are not there. It is not the quantity of sun exposure that the patient needs, but the quality of the exposure.

The Commonwealth Fund, a philanthropic foundation with offices at 1 East 57th Street, announces an initial appropriation of $350,000 to be expended for the construction of two hospitals in rural communities. This appropriation marks the beginning by the Fund of a new project which will involve the building of two such hospitals a year.

Farmville, Virginia, has been selected from among more than fifty applications as the location of the first of these hospitals, following a special study by Henry C. Wright, hospital consultant and former deputy commissioner of the New York City Department of Public Welfare. James Gamble Rogers and Henry C. Pelton, Associated, are preparing plans for this first unit.

On March first the Fund will establish a Division of Rural Hospitals under the direction of Mr. H. J. Southmayd, at present hospital consultant to the Cleveland Welfare Federation. The Department plans to receive applications from rural communities under certain conditions, chief of which is that the Fund will in the case of approved applications contribute two-thirds of the cost of construction and equipment of the hospital, while the local community must contribute one-third. The community must also meet operating and maintenance costs.

The Commonwealth Fund, established in 1918 by Mrs. Stephen V. Harkness and chartered to carry on work "for the benefit of mankind," has just announced additional gifts from Mrs. Harkness which increase its total endowment to $38,000,000. The annual income, amounting last year to $1,339,000, is expended for a variety of educational, scientific, and humanitarian activities. The Fund has devoted special attention to child welfare work and its demonstration programs for the prevention of juvenile delinquency and for the promotion of child health have until now received the major share of its annual appropriations.

PLEURISY: ITS SIGNIFICANCE AND TREATMENT *

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Although pleurisy may seem to be an old topic, it is an important one, inasmuch as we find that in the majority of cases it is one of the earliest symptoms of pulmonary tuberculosis.

Lawrason Brown, in his article on "Pleurisy with Effusion," states, "This can of course be due to other causes than tuberculosis, but the burden of proof should rest on him who says it is due to other causes."

With reference to the diagnosis of pleurisy, I wish to mention but a few of the most important symptoms and signs. Except in the most typical cases, the diagnosis is difficult. In one series of cases the investigator reports that at autopsy 74.4 per cent of the cases were found to have pleurisy, while the clinician in the same series had diagnosed only 2.7 per cent.

In fibrinous pleurisy, pain is often the first symptom noticed by the patient. Other symptoms and signs that follow are the sharp and shallow respiration, cough and friction rub. The friction rub often is difficult to find. With an effusion the symptoms and signs are different. The pain disappears, a tight feeling over the chest often appears. Dyspnea is a common symptom. Abdominal pain, tenderness and rigidity often occur. In many cases pleurisy is confused with acute abdominal conditions such as an acute appendicitis.

Intercostal neuralgia or pleurodynia, herpes zoster, and angina pectoris are the most troublesome in making a differential diagnosis. I will not attempt to give the differential diagnostic points. They are in any text book.

Now, after the diagnosis is made of either fibrinous pleurisy or pleurisy with an effusion, the etiology must be determined. Although pleurisy occurs with pneumonia, typhoid fever, nephritis, heart trouble, pyogenic infection, and with new growths, pulmonary tuberculosis is the most frequent cause. Dr. Robert C. Paterson said, "So frequently is this the etiological fact that it is a

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safe rule to call every pleurisy tuberculous unless there is other definite cause."

In going over the charts of 1,182 cases admitted to the Glen Lake Sanatorium from January, 1916, to March, 1925, I have collected a few facts of interest in this connection. Forty-two charts of the 1,182 mentioned nothing concerning pleurisy. Therefore, we have for consideration 1,140 cases, the results of which are as shown in Table I.

TABLE I

REPORT OF PLEURISY AS FOUND IN 1,140 CASES

Type of Cases—	Number	Per-centage
No history of pleurisy	505	44.3
Fibrinous pleurisy	580	50.8
Pleurisy with effusion	55	4.9
Fibrinous pleurisy and pleurisy with effusion combined	635	55.7

With reference to the cases with fibrinous pleurisy and pleurisy with effusion, there were 635 cases. Of the charts studied, 225 gave no definite date of the pleurisy. Therefore, for our consideration there were 410 cases. Table No. II shows these data:

TABLE II

THE TIME ELAPSING BETWEEN THE HISTORY OF PLEURISY AND THE DIAGNOSIS OF TUBERCULOSIS

Time Period—	No. of Cases	Per-centage
5 years or more	53	12.9
4 to 5 years	12	2.9
3 to 4 years	29	7.0
2 to 3 years	30	7.4
1 month to 1 year	286	69.8

The treatment from the standpoint of the patient is the most important. In fibrinous pleurisy, where no definite cause can be found, the patient should be warned of the fact that he probably has tuberculosis. The patient's life should be regulated. He should be made to understand that the pleurisy has a much greater significance than just the few days' sickness. Periodic examinations should be advised, and at each examination all means and methods of obtaining a cause of the pleurisy put into effect. Then, by these methods, the patient cannot ask as they frequently do, "Why was I not warned before?"

Now, taking up the second type of pleurisy—pleurisy with effusion. The one main factor to keep in mind here is that it is not primary and if no other cause can be definitely pointed out as the cause, it is due to tuberculosis. If we keep this in mind, then a rational treatment can be easily advised; that is, treat every case of pleurisy with effusion as you would a case of pulmonary tuberculosis.

The question arises as to how the effusion is to be treated. Dr. Robert C. Paterson has proven that an effusion is an immunity process. Therefore, the effusion is not harmful. It should not be aspirated unless there is a definite indication.

Five points to be considered as indications for removal are:

1. Specimen for laboratory examination.
2. Pressure symptoms.
3. Mediastinal dislocation.
4. Failure to absorb.
5. Bilateral location.

One outstanding contraindication for the removal of the fluid is that in patients where the fluid has been removed empyema is common, while in cases where the fluid has been left to absorb, pus rarely forms.

Many cases begin to improve after an effusion develops. Why this is, it is hard to explain. Perhaps it is due to the fluid immobilizing the lung and giving it a partial rest.

SUMMARY

1. Case histories of 1,182 patients admitted to the Glen Lake Sanatorium were studied.
2. A history of fibrinous pleurisy and pleurisy with effusion occurred in 55.7 per cent of cases.
3. Fibrinous pleurisy may be the first symptom of pulmonary tuberculosis.
4. Patients with fibrinous pleurisy should be warned that they may have tuberculosis.
5. Pleurisy with effusion should be considered a sign of pulmonary tuberculosis unless it can be proven due to something else.
6. Patients with pleurisy with effusion should be treated as cases with pulmonary tuberculosis until other causative factor can be proven.

BIBLIOGRAPHY

1. Tice: Practice of Medicine.
2. Brown, Lawrason: Jour. Am. Med. Assn., Jan. 14, 1922.
3. Paterson, Robert C.: Can. Med. Assn. Jour., Feb., 1919.

GLEN LAKE SANATORIUM—ITS GROWTH AND DEVELOPMENT*

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Glen Lake Sanatorium is one of the fourteen county sanatoria located in various parts of the state of Minnesota. These are all operating under the 1913 Minnesota Sanatorium law which provides the following:

1. A state supervising body known as the Advisory Commission. The Interim Bill passed by the last legislature abolished this commission and turned its functions over to the State Board of Control, so after July 1, 1925, the State supervision will be carried on by the State Board of Control.

2. State Aid both for construction and maintenance. The state agrees to match the county, dollar for dollar, to the extent of fifty thousand dollars for construction and further to pay the county five dollars per week for each free case.

3. A local Sanatorium Commission of three appointed by the Board of County Commissioners to have complete charge of the Sanatorium. One member of this Commission shall be a physician who shall be approved by the State Board of Health. The original Sanatorium Commission consisting of Mr. Edward C. Gale, Mr. Joseph R. Kingman and Dr. John W. Bell was appointed in 1913 by the Board of County Commissioners and has been reappointed from time to time with the exception of Dr. Bell, who resigned in 1919 because of ill health, Dr. S. Marx White being appointed in his place. This continuation of the same Board members had secured a uniform and progressive development of the Sanatorium during its period of growth.

4. That any resident of the county in any stage of tuberculosis shall be eligible for care in the Sanatorium but that preference shall always be given to patients in the most advanced stages of the disease. This means that preference must be given to the advanced case, no matter when the application is received; and that the early and favorable moderately advanced cases can be admitted only after all of the far-advanced and unfavorable moderately advanced cases have been taken care of. The reason for this is, that the State Sanatorium is planned for the early and favorable moderately advanced cases, and the county sanatoria are planned to take care of those cases who are physically unable to go to the State Sanatorium. It was felt that such a plan would round out the tuberculosis campaign and give care to all types of cases.

5. That some rate should be charged those patients who were financially able to pay but that no patient should be denied treatment because of his financial condition. The rate was left to the County Sanatorium Commission, and the Hennepin County Sanatorium Commission has fixed a maximum rate of twenty-one dollars per week and a minimum rate of two dollars per week with the further proviso that anyone who is unable to pay even that amount shall be admitted for treatment without charge.

6. That no limit should be placed upon the length of time anyone could receive treatment at any of the county sanatoria.

Acting under the authority conferred upon them by this law, the Sanatorium Commission began plans for a sanatorium which was finally located at Glen Lake. The original plans called for a cottage type of institution with an ultimate maximum capacity of about two hundred. The first unit, consisting of an administration building, a separate heating plant and one cottage, in all caring for about fifty patients, was ready for occupancy in January, 1916.

The institution proved popular, it was soon filled, and a waiting list was created and, contrary to the usual custom, patients were apparently eager to enter the Sanatorium. The Commission has made every effort to meet the demands of the community and has increased the capacity from time to time in an attempt to care for the waiting list, even though at one time there were as many as two hundred people who had made application to the Sanatorium and for whom there was no room. The growth has been steady and thus in about nine years

*Read before the Hennepin County Medical Society at Glen Lake Sanatorium, Oak Terrace, Minn., June 8, 1925.

time we find a small meagerly equipped cottage type of sanatorium of fifty beds enlarged into a complete hospital-cottage type of sanatorium of over six hundred beds ready to care for tuberculosis in any stage and to cope with practically any complication which may arise. This unit includes adequate accommodations for nurses and employees; three residences; a large well-equipped central kitchen; adequate dining hall facilities for ambulant patients, doctors, nurses and employees; an auditorium, so located that it can be used by both the ambulant and bed patients (rather an unusual feature, as usually the auditorium is in a detached building and can only be used by the up-and-about patients); a social service department; an occupational therapy department; a separate children's unit of sixty beds; two cottages for ambulant patients; an infirmary unit of over four hundred and fifty beds, so constructed that it can be used either for the bed-ridden or ambulant patients as needed. This latter unit is completely equipped for the diagnosis and treatment of tuberculosis in any form and contains a modern laboratory, a complete *x*-ray department, two operating rooms, a dental suite for two full-time dentists, and heliotherapy quarters for about seventy cases of extra-pulmonary tuberculosis, the first unit of which was opened in 1921. Last but not least, the Sanatorium has a complete radio installation which provides a separate unit for the children's building with loud speakers for each ward, a receiving set and loud speaker in the auditorium and a receiving set and individual ear phones for each bed in the infirmary unit and the two cottages.

The Children's unit, consisting of a detached four-story building with room for sixty-five children ranging in age from birth to puberty, is divided into two services, educational and medical.

The lower floor is given over to recreational and educational life of the child and consists of a large play room for use during the stormy days and school room for academic and industrial purposes. This is a very important phase of a child's life in a tuberculosis sanatorium and one which I think is not stressed often enough. There is no reason why the education of the child should be interrupted in the least by his stay in the Sanatorium. His life there should be so regulated as to include time for class work. Usually because of his improved health he is able to carry on the required work in a shorter time than the child outside. For instance, all of our eighth grade children passed the State examination for entrance to High School. They were able to do this on two hours of supervised work per day. Even those children who are confined to their beds are able to carry on their class work while regaining their health.

In the summer time the school books are forgotten and the children spend their time in the fields and woods around the Sanatorium learning to know and appreciate the wonders and beauties of nature.

In the evening the children have a bed-time story hour, a feature which adds much to their life in the institution, making it more like home than anything else they do. All of this educational work is carried on by three teachers, two supervising the academic work and one the industrial work.

The medical work is carried on on the three upper floors, the first of which contains a dining room for all children able to come to their meals and two wards for boys over four years of age.

The second floor contains the Alpine or quartz mercury vapor lamp room and two wards for girls over four years of age.

The isolation rooms and wards for children below four years of age are on the top floor. This is really a deck house on a flat roof which is used as an uncovered porch and where these children receive sun baths and have their sand boxes, etc.

Each of the other two floors have an uncovered porch adjoining the wards, so that the children can be wheeled in their beds from the wards to the porch. This is the best type of treatment for the type of tuberculosis which usually occurs in childhood and with this treatment the results are nearly one hundred per cent perfect.

Thus the entire life of the child is cared for. When the time for leaving comes we try to send him out a little better child in every way than when he entered. Such a program should mean that, for the child at least, tuberculosis has not been an evil unmixed with good.

This summer the Sanatorium will open a summer camp which is a continuation of the former Visiting Nurses Camp, which was maintained under the Community Fund. The Visiting Nurses Association will supply the personnel and Dr. Lippman will have charge of the medical work as in the past.

The Staff has increased from one visiting and one resident physician, in addition to a superinten-

dent, to eight full-time clinical residents, Drs. Jennings, Bendes, Boquist, Mattill, Hastings, Fenger, Wall and Webb; a director of laboratory, Dr. W. L. Hardesty; two resident dentists, Drs. Bryant and Reppeto, and a pharmacist in addition to the laboratory and *x*-ray technicians. In addition to that we have been able to convince the University of Minnesota that there is something of real educational value in a tuberculosis sanatorium and every medical student has to reside three weeks in Glen Lake Sanatorium before he can receive his diploma. Also the University School of Nursing has assigned all students to the Sanatorium for a six weeks' residence before they can receive their nursing diploma. If Miss Gladwin of the State Board of Nursing Examiners has her way it will not be long before instructions in tuberculosis will be a required part of the curriculum of all training schools for nurses.

The Visiting Staff was changed to a Consulting Staff soon after the Sanatorium was opened. The Consulting Staff has grown with the growth of the Sanatorium, and consists of the following: Consultants Emeritus, Dr. J. W. Bell and Dr. G. D. Head; Active Consultants, Medicine, Dr. Henry Ulrich, Dr. Edward Gardner and Dr. Albert Peppard; Tuberculosis, Dr. W. J. Marcley, Dr. J. A. Myers, Dr. Alexander Josewich and Dr. Frank Hacking; Surgery, Dr. A. A. Law, Dr. Kenneth Bulkley and Dr. J. A. Johnson: Orthopedics, Dr. E. S. Geist, Dr. M. O. Henry and Dr. C. A. Reed; Ophthalmology and Oto-laryngology, Dr. Horace Newhart, Dr. W. E. Camp and Dr. E. R. Hansen; Obstetrics and Gynecology, Dr. J. C. Litzenberg and Dr. D. W. DeCarle; Pediatrics, Dr. F. W. Schlutz, Dr. Edward Anderson. Dr. H. S. Lippman and Dr. N. O. Pearce; Neurology, Dr. J. C. Michael; Roentgenology, Dr. R. G. Allison and Dr. Russell Gates; Urology, Dr. O. Owre and Dr. G. J. Thomas; Serology, Dr. D. Stern; Pathology, Dr. E. T. Bell; Bacteriology, Dr. W. P. Larson; Dermatology, Dr. Sam Sweitzer and Dr. John Butler; Public Health, Dr. F. E. Harrington.

It was hoped that when the entire six hundred beds were available for use the Sanatorium would be able to care for all of the applicants and still have some vacant beds for emergency use. But the Sanatorium is filled and has a waiting list of over fifty adults and is again faced with the prospect of only admitting the advanced case, i. e., the case who is denied treatment at the State Sanatorium because of his physical condition.

The Commission feel that, as the official agency charged by the 1913 Sanatorium law with caring for the tuberculous of this Sanatorium district, they have not discharged their full duty to the community as long as there are active cases of tuberculosis who wish care and cannot receive it.

The question to settle is, how best can this increased demand be met? Shall it be with additional sanatorium beds or in some other way, for example, by means of an out-patient department so equipped and financed that it would be able to offer bedside or sanatorium care to those who are waiting for admission to the Sanatorium? This out-patient department would, of course, reduce the time required for treatment after the patient reaches the Sanatorium and would therefore increase the turnover and thus have the same effect as increasing the capacity of the Sanatorium without the cost of the additional beds.

Such an out-patient department would be modeled rather closely after the Chicago Municipal Tuberculosis Sanatorium Dispensary, developed by the late Dr. Sacs and Dr. John Dill Robertson, former Commissioner of Health, which co-operates with the Health Department, the private physician, the employer and every recognized social and civic agency in the community in an effort to adequately meet the tuberculosis situation.

Since the Sanatorium offers the greatest measure of service in the treatment of tuberculosis, the out-patient department should endeavor in so far as possible to follow the sanatorium routine in the care of the individual patient. In order to assure this, the medical supervision of the dispensary should be under the care of one of the Sanatorium-trained physicians. The desirability of institutionalizing the open active cases from the standpoint of the community's welfare as well as that of the individual cannot be questioned. However, such a procedure, for obvious reasons, is not always possible. Without question the next best thing would be home supervision under sanatorium-trained physicians.

Cases under the care of private physicians should come under the supervision of the dispensary only in so far as compliance with the Health Department rules governing tuberculosis is concerned. The nurse makes an investigation of the home with

special reference to the sanitary and sociologic conditions and submits the report of the situation. She is prepared to carry out the attending physician's orders and to give bedside care if requested. The nurse collects a specimen of sputum for laboratory examination and leaves a copy of the state law governing tuberculosis with the patient. Otherwise the instructions relative to the prevention and treatment of tuberculosis are left entirely to the private physician and the dispensary physician does not interfere unless asked to by the private physician.

There has been a marked reduction in the death rate from tuberculosis during the past ten years. It is hoped that this reduction will continue and will more than compensate for the increase in cases incident to increasing population. If it does, then we are now at the peak of our load and if by means of an out-patient department, such as I have outlined above, we can tide over the present situation, the great expense of erecting more beds will be avoided and the taxpayers of this community will be saved considerable expenditure. At least, the Commission thinks the effort is worth a trial and that no money should be spent for additional beds until it is definitely proven that the dispensary system is inadequate.

THE FUTURE OF THE UNIVERSITY HOSPITALS

During the past year alone the University Hospitals have made a fourth of the stride between their 1924 status and 600 beds by adding to the original 200-bed capacity approximately 100 more, through the construction and opening the Memorial Cancer Institute and the Todd Memorial Eye, Ear, Nose and Throat units.

Ultimate construction of the Minnesota Hospital and Home for Crippled Children, for which William Henry Eustis is giving the funds, will add about 50 more beds to University of Minnesota hospital facilities. The hospital unit under the Eustis gift will be built on the campus, while the Convalescent Home will go on the property adjoining the Dowling School site which Mr. Eustis gave. It lies on the west bank of the Mississippi River near Minnehaha Park.

More than a year ago the Medical School announced plans that would involve the erection there of a Women's Hospital, a Home for Nurses, a Dispensary Building to house the department which already cares for 60,000 patients annually at no more cost to them than a registry fee of ten cents, an Administrative Building, an addition to the Service Building and the completion of the unfinished wing of Millard Hall, the main medical building. — *Minnesota Chats*, Jan., 1926.

FLOCCULATION IN TUBERCULOSIS *

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The serum of the tuberculous is more easily coagulated by the combined actions of heat, sodium chloride, and alcohol than is the serum of the healthy. This fact constitutes the principle of flocculation reactions in tuberculosis, our knowledge of which begins with the works of Sachs and von Oettingen,[1] and Daranyi.[2]

It is generally admitted that this liability to flocculation is so much greater in tuberculosis than in health that the reaction is of some value. On a number of points, however, there is difference in opinion. Chief of these are:

1. The matter of technic.
2. Practical specificity of the test (i.e., to what extent may other diseases give the reaction).
3. Mechanism of the reaction.

Hoping to contribute data which may help clarify these points, the writer has carried out the reaction in 300 cases, comprising patients and employees of the Sanatorium, and guinea pigs, healthy and diseased. The work is being continued, but the results have been constant enough so far to warrant certain tentative generalizations, which will be presented in this paper.

A number of these reactions were performed before the question of technic had been decided—for the time being at least—by the writer. In a few others, the clinical condition was uncertain. None of these will be reported. No case whether of men or animals is here stated to be tuberculosis in which Koch's bacillus was not at one time or another demonstrated.

TECHNIC

The procedure which I have found most reliable is similar to that of Baum[3] and is carried out in the following way:

Into four test tubes place respectively 0.4, 0.3, 0.2, and 0.1 c.c. of serum, which must be clear, not colored by hemoglobin, unheated, and not over a day old.

To 41 c.c. of 2 per cent saline add 10 c.c. of 95 per cent alcohol. To each of the four tubes add 3.8 c.c. of this mixture.

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*Read before the Hennepin County Medical Society at Glen Lake Sanatorium, Oak Terrace, June 8, 1925.

Shake the tubes, heat in a water bath at 60° C. for a half hour, set the tubes aside, and read the results after four or five hours. If in doubt, centrifugalize. A normal serum shows a distinct opalescence. If the serum be tuberculous, gross flocculation occurs in some or all of the tubes and white floccules may settle to the bottom. If definite flocculation occur in only the first tube, the reaction is recorded 1 plus; if in the first two tubes, 2 plus; if in the first three, 3 plus; if in all tubes, 4 plus.

Larger amounts of serum have been recommended, but I have found that such amounts occasionally give rise to weak positives in individuals presumably healthy. This does not apply to serum from the guinea pig, which is far less prone to error on the positive side. This difference is striking and constant.

SUMMARY OF RESULTS

Clinical condition—	No. of Cases
FOUR PLUS REACTIONS	
Cavitation	15
Fibroid phthisis	4
Tuberculous nephritis	1
Tubercuous guinea pigs	15
THREE PLUS REACTIONS	
Fibroid tuberculosis	12
TWO PLUS REACTIONS	
Tuberculosis (old cases with little activity)	2
Tuberculous arthritis	2
ONE PLUS REACTIONS	
Arrested tuberculosis	10
Healthy nurses	2
Tuberculous gland	1
Fibroid phthisis	1
Bronchiectasis	1
Incipient tuberculosis	1
Ulcerative tuberculosis, syphilis, and diabetes mellitus (one patient)	1
NEGATIVE REACTIONS	
Healthy guinea pigs	50
Guinea pigs moribund in pneumonia	4
Arrested tuberculosis	4
Healthy individuals	2
Bronchiectasis	1
Advanced cavitation	1
Cholecystitis	1
Hyperthyroidism	1
Syphilis	1

From analysis of these data, it appears that:

1. Strongly positive reactions have occurred only in tuberculosis.

2. The intensity of the reaction is roughly proportional to the extent and activity of the process.

3. Weak positives are occasionally found in those with mild tuberculous infection and in individuals presumably healthy.

4. Negative reactions have occurred but once in active tuberculosis.

Thus it would seem that one great value of the reaction consists in its power to differentiate between active tuberculosis in which the bacilli are not found, and other diseases which clinically simulate it.

OTHER DISEASES AND THE REACTION

One might expect the reaction to be positive in other destructive diseases, notably syphilis, in which the plasma is so profoundly altered.

As to syphilis, I have not yet enough data to speak with assurance. We do not treat lues here except in so far as it is a complication of tuberculosis. From the evidence at hand I do not believe that syphilis gives the reaction in those who have not tuberculosis or accentuates it in those who have. To this phase of the problem our attention at present is being especially directed.

MECHANISM

In this reaction the colloidal molecules group themselves into amorphous floccules, remain for a while in suspension, and fall to the bottom of the tube. The reason for this colloidal instability we do not know.

Perhaps the most plausible hypothesis postulates a serologic alteration by the products of tissue destruction. If this assumption be correct, why does not syphilitic fluid give the reaction—if it does not? Elsewhere[4] the writer has expressed his belief that in syphilis the plasma is laden with products of tissue destruction and that these are largely responsible for the Wassermann reaction. Others appear to be of this opinion.

Here it is very important to remember that the tissues destroyed by *Treponema pallidum* are widely different from those destroyed by Koch's bacillus. The treponema attacks highly specialized cells, including those of the human brain and heart —highest cells in the biologic realm. Koch's bacillus has no such predilection. Thus it may be that serologic reactions in both diseases depend on tissue destruction but differ according to the kinds of tissue destroyed.

SUMMARY AND DISCUSSION

1. Flocculation in tuberculosis appears to have some value. The reaction may not—even in a practical sense—be specific. But this objection is

only relative and applies to most other laboratory determinations, as, for example, the white count.

2. In general, tuberculous serum has given positive reactions, the intensity of which has been roughly proportional to the extent and activity of the process.

3. Normal serum and the serum in diseases other than tuberculosis have yielded negative or weakly positive reactions.

4. The greatest value of the reaction appears to consist in the fact that it will help us to distinguish between active tuberculosis where the bacillus is not found, and other conditions which clinically simulate that disease.

REFERENCES

1. Sachs, H., and von Oettingen, K.: München. med. Wchnschr., 1921, lxviii, 351.
2. Von Daranyi, J.: Deutsche med. Wchnschr., 1922, xlviii, 553.
3. Baum, F.: Am. Rev. Tuberc., 1924, x, 4, 449.
4. Hardesty, W. L.: On the mechanism of the Wassermann reaction. Am. Jour. Syph., 1924, viii, 4, 744.

ETHYLENE AND NITROUS OXIDE AS ANESTHETICS

Ethylene produces greater relaxation than nitrous oxide, also much higher percentages of oxygen can be administerel with it and, therefore, cyanosis is not produced as with nitrous oxide. According to New and Non-official Remedies the advantages over nitrous oxide are equally rapid but more pleasant induction, satisfactory relaxation without cyanosis or sweating, and rapid recovery. The disadvantages of ethyline are the odor, the inflammability of the gas, and an apparently increasing oozing of the wound during its use. (Jour. A. M. A., Jan. 30, 1926, p. 368.)

CRYSTALLINE INSULIN

In a significant address—the sixth annual Pasteur lecture—recently given before the Chicago Institute of Medicine, John J. Abel made public announcement that he had obtained a crystalline form of insulin. The chemical and medical world will await with great interest further developments, particularly the proof of the identification and chemical constitution of the product. The crystallization of the pure principle "insulin" or a compound of it may well be considered an outstanding accomplishment in the life of a man already distinguished by his conquests in biochemistry. (Jour. A. M. A., Jan. 30, 1926, p. 350.)

RESTRICTION OF THE SALE OF BARBITAL (VERONAL)

While no laws have been passed in the United States against the sale of barbital, the New York sanitary code prohibits its sale without a prescription. In Useful Drugs it is stated that many cases of poisoning, some fatal, occur from the indiscriminate use of barbital by the laity. (Jour. A. M. A., Jan. 23, 1926, p. 297.)

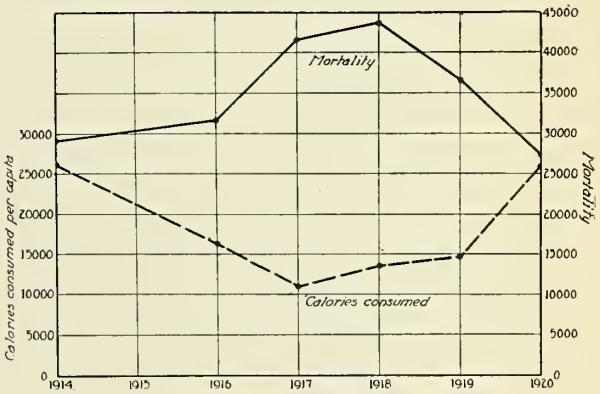
DIET IN THE TREATMENT AND PREVENTION OF TUBERCULOSIS *

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In the modern successful treatment of tuberculosis diet is second only in importance to rest.

The diet of the tuberculosis patient must be prescribed by the physician just as drugs are prescribed in certain other diseases. Numerous difficulties are encountered. For example, the gastro-intestinal tract may be in distress reflexly or because of toxemia. Again, on account of toxemia the patient may have marked loss of appetite. Furthermore, tuberculous enteritis not infrequently coexists with pulmonary tuberculosis, thus rendering the problem of diet very difficult.

If tuberculous enteritis is not present usually the gastro-intestinal disturbances disappear after the patient is placed at rest, and the toxemia is reduced. In any event the gastro-intestinal disturbance must be corrected at the earliest possible moment for it is obvious that with a disease like tuberculosis a good result cannot be accomplished unless a sufficient amount of food can be ingested, digested and assimilated by the patient.



Daily Food Requirement.—Much scientific study and observation has resulted in our possession of considerable very definite information about foods in tuberculosis. We know that food with a caloric value of between 2,500 and 3,000 is necessary for the average case and that much more food is undesirable. The food elements composing the necessary total amount should consist of 90 to 100 grams

*Read before the Hennepin County Medical Society, at Glen Lake Sanatorium, Oak Terrace, Minn., June 8, 1925.

of protein, 80 grams of fat, 500 grams of carbohydrate and 2 quarts of water.

The proteins must be of the right kind. This is usually insured if 50 per cent of the protein is derived from animal tissues or animal products such as milk, butter, etc. The fat may be derived from butter and other food substances easily digested and rich in fats. The carbohydrates may be derived from sugars and starch-containing vegetables. An abundance of green leafy vegetables and fruits must be included in order to insure an abundance of vitamins in addition to those taken in butter, milk, etc. If such a diet is allowed one need have no worry about the mineral requirements of the body. In short the diet must consist of all the food elements necessary for maintenance and repair of the body.

Metabolism of the Body in Tuberculosis.—McCann and Barr[1] and Grafe[2] have found that in tuberculous patients with fever there is considerable rise in the metabolic rate, reaching as high as 20, 50 and even 75 per cent above the normal; whereas those patients with little or no fever have normal metabolic rates. Long[3,4,5,6] has pointed out that with fever this is to be expected because of the well known law in chemistry that raising the temperature increases the speed of all reactions. Thus with fever there is an increase in combustion of body fuel, which increases the temperature of the body and this in turn speeds up the chemical reactions. If excess heat elimination is not provided the fever is further increased and this in turn still further increases the speed of the chemical reactions; thus a vicious circle is established. Scientific observations have shown that even in advanced tuberculosis the respiratory quotient is normal, indicating that all types of foods are easily burned in the tuberculous patient.

Again, the tuberculous patient lying in bed may have such a severe cough as to require the expenditure of much energy and a consequent increase in metabolism.

Obviously whether the increase in metabolism is due to fever or cough or both, the only solution is to reduce the fever and decrease the cough. This is not always easy in either case. Absolute rest in bed will do much and will soon bring the temperature to normal and cause a complete subsidence of the cough in many cases. However, one encounters cases in whom the high temperature persists and the attacks of coughing continue in spite of the application of all known measures. In such cases the outlook cannot be good since they not only burn up the food they are able to take but also draw upon the foods stored in their tissues until a state of extreme emaciation is reached. For a long time it was believed that such patients should receive large amounts of protein in order to replace the protein that is being lost from the body. Indeed, it has been shown that patients suffering from wasting diseases such as tuberculosis and typhoid fever have a "negative nitrogen balance"—that is, more nitrogen is excreted in the urine even though very liberal amounts of protein are in the diet. This is good evidence that the protein of the body tissues is being destroyed even when an excessive amount of protein is administered in the diet. It appears that there is a definite "toxic destruction of protein" in tuberculosis and that the usual "protein sparing" substances such as sugars and fats do not suffice to prevent entirely this destruction. Long believes that the toxins derived from tuberculous foci may effect protein metabolism in the following ways: (1) they may so affect the appetite that the patient fails to take enough food to replace the daily loss; (2) they may injure the cells so that the cells fail to retain sufficient protein to make good their daily loss; (3) they may stimulate the cells to an excessive metabolism.

Enough scientific data have accrued that we can now quite accurately estimate the amount of food that is best in each individual case. From the foregoing statements it is obvious that the first attempt should be to reduce the cough, fever or any other condition that increases metabolism. All too frequently in the past and occasionally at the present time the first attempt has been to employ forced feeding. This is done on the ground that an excess of food elements brings about reconstruction as fast as destruction occurs. Again it is believed by many that the healing process about the lesion goes on more rapidly if excessive amounts of food substances are circulating in the blood. There is no scientific evidence that either of these actually occurs in tuberculosis. It is true that in certain cases with fever a reasonable amount of food easily digested and assimilated may be allowed in addition to the regular meals. However, there is no excuse for the huge amounts of food consumed under compulsion by some patients. One occasionally meets

a patient who has taken food with a daily caloric value of between 5,000 and 7,000. McCann,[7,8] Long and others have pointed out that from the standpoint of metabolism a considerable burden is thrown upon certain organs, particularly the lungs, when forced feeding is employed. For example, water and nitrogen, two end-products of metabolism, are excreted largely through the kidneys, while carbon dioxide is eliminated by way of the lungs. It is the carbon dioxide elimination in which we are most interested in tuberculosis since in the combustion of all foods it is an end-product. The more food the patient consumes the greater the amount of carbon dioxide produced. Since this is all eliminated through the lungs one reaches a point where its concentration is so high as to require more frequent breathing for its proper elimination. This is all brought about involuntarily through the respiratory center. In the treatment of pulmonary tuberculosis our greatest aim is to rest the lung through reducing the number of respirations per minute. Obviously in forced feeding we are defeating our aim.

In building a diet for tuberculous patients one must not neglect the vitamin requirement of the body. Obviously all known vitamins are of importance but of greatest importance is vitamin A. When it was first known that natural or artificial sunlight would prevent and cure rickets, a logical thought was that sunlight would substitute for vitamin A. It was first believed that vitamin A was the antirachitic element. Careful scientific investigation by Hart,[9] Steenbock, and others, however, revealed the fact that vitamin A is essential for the growth of chicks. We also know that when young animals such as rats are fed upon a diet wholly lacking in vitamin A they continue to grow for a short time because vitamin A is stored in the tissues. When this supply is exhausted, growth ceases and after a short time the animals begin to lose weight. A point of great significance is that after the vitamin A is exhausted there appears a lowered resistance on the part of the body to bacterial infection. This is particularly true of infections of the respiratory tract. Indeed, it has been pointed out by Sherman and McLeod[10,11] that when rats are fed over a long time upon a diet low in its vitamin A content "there appears in early adult life an increased susceptibility to infection and particularly a tendency to break down with lung disease at an age corresponding to that at which pulmonary tuberculosis so often develops in young men and women." The bacillus involved is different; but the close parallelism of increased susceptibility of the lung to infection at this stage of the life history appears very significant, especially in view of the fact "that the vitamin A content of lung tissue varies with that of the food."

Vitamin A is present in butter, cream, cod liver oil and certain of the green leafy vegetables. Before its distribution in foodstuffs was as well understood as at present and indeed before vitamines were known at all, cod liver oil was prescribed extensively in tuberculosis. Now we know that cod liver oil contains nothing of importance in the treatment or prevention of tuberculosis that is not abundantly present in certain palatable foodstuffs. This is welcome news to the thousands of sufferers from tuberculosis who in the past have taken huge quantities of cod liver oil under protest. Please do not misunderstand me. I do not mean to decry the use of cod liver oil or to discredit its value. In homes where a sufficiency of butter, cream and green leafy vegetables are not available or will not be taken by the patient cod liver oil serves a real purpose. Again, for patients to whom it is not objectionable, it may serve a real purpose. In most cases, however, if it is left to the choice of the patient he will secure his vitamin A requirement from palatable foods and receive just as much benefit as though he were taking cod liver oil.

In addition to vitamin A, cod liver oil also contains the anti-rachitic element. That these are two distinct substances has been demonstrated by oxidizing cod liver oil until the vitamin A is all destroyed and finding it still possessed of its antirachitic qualities. Here again a substitute has been reported for cod liver oil in the proper exposures to natural or artificial sunlight. Hess[12,13] and others have shown that not only the therapeutic but also the preventive effects of sunlight are as good as those obtained from the use of cod liver oil.

During and after the world war there existed a remarkable period for the study of such subjects as the effects of reduced food rations upon the incidence and mortality of tuberculosis. Selter and Nehring[14] compared the mortality statistics of the Health Department of the German Government for all German cities with a population of 40,000 and over at four-week intervals. With the mortality statistics they compared the calories consumed daily

per capita. The accompanying chart shows the increase in tuberculosis mortality accompanying the drop in average food calories per capita and the return to the normal in 1920. These authors point out that the privations, especially the diminished rations brought on by the war, caused the death of many tuberculous persons who during normal times would have lived much longer. This was in addition to the greater incidence of tuberculosis arising from war conditions.

From the scientific studies that have been made, therefore, we know the approximate daily food requirement of tuberculous patients. We have sufficient evidence against forced feeding and sufficient knowledge about the vitamin requirement of the body to aid the patient very materially in his battle with tuberculosis, but infinitely greater than these applications of foods in the treatment of tuberculosis is the application of our knowledge to the prevention of tuberculosis.

REFERENCES

1. McCann, W. S., and Barr, D. P.: Clinical calorimetry. XXIX. The metabolism in tuberculosis. Arch. Int. Med., December, 1920, 26, 663.
2. Grafe, E.: Stoffwechsel Untersuchungen bei Schweren Afebrilen Tuberkulosen. Münch. med. Wchnschr., September 17, 1920, 67, 1081.
3. Long, E. R.: The principles of normal metabolism. Journal of the Outdoor Life, March, 1925, 22, 169.
4. Long, E. R.: Metabolism as changed in consumption. Journal of the Outdoor Life, April, 1925, 22, 240.
5. Long, E. R.: Protein metabolism in consumption. Journal of the Outdoor Life, May, 1925, 22, 309.
6. Long, E. R.: Rest and metabolism. Journal of the Outdoor Life, June, 1925, 22, 367.
7. McCann, W. S.: The protein requirement in tuberculosis. Arch. Int. Med., January, 1922, 29, 33.
8. McCann, W. S.: The effect of the ingestion of foodstuffs on the respiratory exchange in pulmonary tuberculosis. Arch. Int. Med., December, 1921, 25, 847.
9. Hart, E. B., Steenbock, H., Lepkovsky, S., and Halpin, J. G.: The chick's requirement for vitamin A. Jour. Biol. Chem., June, 1924, 40, 341.
10. Sherman, H. C., and McLeod, F. L.: Relation of vitamin A to growth, reproduction and longevity. Proc. Soc. Exper. Biol. and Med., 1924, 22, 75.
11. Sherman, H. C.: The fat-soluble vitamin in relation to health. The Nation's Health, October, 1923.
12. Hess, A. F.: Influence of light in prevention and cure of rickets. Lancet, 1922, 2, 367.
13. Hess, A. F.: Experiments on the action of light in relation to rickets. Am. Jour. Dis. Child, 1924, 28, 517.
14. Selter, H., and Nehring: Einfluss der Ernährung auf die Tuberkulosesterblickheit. Zeitschi f. Yuberk, April, 1921, 34, 1.

TONSILLECTOMY IN THE TUBERCULOUS *

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The attitude of the average physician toward operative procedures on those afflicted with an active pulmonary tuberculosis, especially in patients requiring a general anesthetic, has long been one of extreme conservatism. There exists a widespread and deep-seated tradition that all operations on the throat in the tuberculous, especially tonsillectomy, are likely to produce exacerbation of the existing pulmonary disease.

This tradition, in the light of recent experience in this institution (the Glen Lake Sanatorium for Tuberculosis), seems to be largely a fallacy, and, in the interests of the many patients who are entitled to the best and most modern therapeutic effort, should be challenged. This occasion seems to afford an opportune moment to raise the question as to the tenability of our old views on this subject and to ask if they cannot be profitably revised.

The old arguments against tonsillectomy in a patient with pulmonary tuberculosis are chiefly of two classes:

1. It has been claimed that the struggling of the patient, incident to a throat operation, especially during and after a general anesthetic, is likely to cause a spreading of a localized focus through the breaking down of nature's barriers. This is probably less true when the operation is skillfully performed under a local anesthetic; but even then we see in certain cases more or less violent gagging, coughing and nausea, with occasionally aspiration of mouth content or the swallowing of blood.

The second important argument against tonsillectomy in these cases is found in the definite nutritional disturbance which has in the past usually followed removal of the tonsils. This has been caused by the traumatism and the consequent reaction following a tonsillectomy, with interference with deglutition and a greatly diminished intake of food. The result has been a material loss in weight and a lowered body resistance with a supposed possible exacerbation of the disease. Of scarcely less importance is the possible lowering of vitality through loss of blood at the time of operation or through secondary hemorrhage.

Opposed to these objections we have a great

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unanimity of opinion as to the desirability of removing every possible known focus of infection such as pathological tonsils, dento-alveolar abscesses, chronic para-nasal sinusitis, chronic otitis media, etc., in patients generally. No one questions the tremendous advantage to the general health of the individual from tonsillectomy when it is definitely indicated and is properly performed. We need only refer to the convincing publication of Kaiser* on the Effects of Tonsillectomy on the General Health of 1,200 School Children as compared with an equal number not operated upon, or we need only ask any observant physician to recall individual cases in his own practice to vindicate this statement. Yet many in private practice even today hesitate when it comes to giving the benefits of a tonsillectomy to a tuberculous patient, in spite of the presence of obviously diseased tonsils.

In this institution, which I believe is justly recognized for its progressiveness in all matters pertaining to the study and care of this particular class of patients, the principle has become well established to give to the tuberculous patient the same opportunity for physical gain through the removal of pathological tonsils as is given to the non-tuberculous patient. In other words, unless the patient is in a hopeless condition, tonsillectomy is advised to free the patient of an existing handicap in the form of diseased tonsils, in spite of the presence of tuberculosis. Accordingly a very generous policy has been followed in giving the tuberculous patient at Glen Lake this benefit of the doubt.

Between April 17, 1919, and May 23, 1925, with a total of 1,490 admissions, 122 tonsillectomies have been performed on tuberculous individuals. Of these, 81 were on adults under local anesthesia and 41 on children, when a general anesthetic was employed. These operations were performed largely by Drs. Camp, Hansen and myself, under a technic which is practically uniform in all essential details. The results have been surprisingly gratifying. Of the 122 cases only one did not prove satisfactory as to the ultimate outcome and there exists the possibility that her death may have been hastened by the operation, though of this we have no proof. The others for the most part have done well, and in many instances date the beginning of a marked improvement to the tonsillectomy.

In consequence of these results, though the total number of cases may seem small, we are ready to affirm that in our opinion the tuberculous subject under institutional care is as good a surgical risk for tonsillectomy as the non-tuberculous, the benefits to be derived from the operation far outweighing the slight risk of spreading the disease through operative procedure.

It is our practice in this institution to avoid by all possible means those untoward results mentioned above and which have been feared in the past. A painless, speedy, clean operation with the minimum amount of traumatism, hemorrhage and gagging is always sought. Even in operations under local anesthesia the aspiration of mouth secretions is obviated by posture and by allowing the patient the utmost freedom in the matter of permitting him to expectorate frequently during the operation. This and the assurance to the patient that he is to consider himself under no bodily restraint goes far to do away with all struggling, gagging and coughing. General anesthesia is administered most carefully in order to eliminate all struggling, cough, and the aspiration of mouth secretions and blood.

All patients are carefully selected by the resident staff as to their fitness for the operation, special attention being given to temperature and clotting time. Naturally the most favorable results are to be expected in young tuberculous patients, who often have pathological cervical glands resulting from infected tonsils.

A very large factor which has contributed to the successful results in the cases cited is the extremely good pre-operative and post-operative care routinely administered at this institution. The nutritional needs are particularly well met both before and after the operation and the patient remains in bed for many days after the tonsillectomy. The result is a far smaller loss in weight than occurs in the average private ambulatory tonsillectomy, or the one who remains in the hospital but a day following the operation.

Herein lies a valuable suggestion for the after-care of our patients, whom we often dismiss too soon and without adequate instruction or supervision as regards intake of food and rest.

With no other basis than the relatively small experience in tonsillectomy on the tuberculous gained at Glen Lake, I am confident that the operation should be performed much more frequently than has been the usual practice, thus giving to those afflicted with the great white plague a better chance to fight out the long battle towards health.

*J. A. M. A., 78:1869-1873, June 17, 1922.
Am. J. Dis. Child, 23:139-141, Feb., 1922.

THORACOPLASTY IN THE TUBERCULOUS *

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While artificial pneumothorax is a therapeutic agent of infinite value in most cases of unilateral pulmonary tuberculosis, in 20 per cent of the cases where it is indicated it cannot be effectively used. This 20 per cent comprises the cases where the diseased lung cannot be collapsed by the injected gas, because of adhesions between the visceral and parietal pleuræ. These patients, because of failure of lung collapse, are many of them relegated to the class of hopeless incurables. Two-thirds of them have been shown to die early, while of those who can be collapsed by gas, approximately two-thirds recover.

When frequent attempts at artificial pneumothorax fail, these one-sided cases of pulmonary tuberculosis must have recourse to surgery for their hope of relief. It is this small class of cases which can be offered relief by extra-pleural thoracoplasty.

This operation as it was finally standardized by Brauer, Frederich and Sauerbruch, consists of a long paravertebral incision close to the spine and removal of segments of all the ribs except the twelfth. These segments vary in length from 2 cm. in the first rib to 15 cm. in the lower ribs. The removal of the ribs subperiosteally and without invasion of the pleura permits a collapse of the chest wall with coincident collapse of the affected lung.

While this operation ideally should be undertaken only when one lung is involved, yet in practice it is rare that, with extensive involvement of one lung, we find no involvement of the other lung. So that with inactive tuberculosis or with slight involvement of the "well" lung the operation is not contraindicated.

The ideal case for operation is the chronic one of long standing which has undergone considerable fibrosis so that contraction has already displaced the diaphragm, heart or mediastinum. In this type of case removal of the ribs on one side does not invite very much further displacement with its attendant danger of mediastinal flutters.

By preference this operation should be done in two stages. Sections of the five or six lower ribs (leaving the twelfth) should be removed first. Within three weeks if possible the upper ribs should be removed. The short interval between the first and second stage operations is indicated because new ribs reform from the periosteum of the ribs which have been removed. These new ribs reform early, so that if the interval between the operations is too long, the new ribs may defeat the object of the operation.

The surgeon who does this operation is only the instrument of the tuberculosis specialist, who should keep each case to be operated under prolonged careful scrutiny, preferably in a sanatorium, before the surgeon is called in. It is distinctly the province of the internist to dictate the advisability of operation. These cases demand, then, the closest cooperation between the internist and the surgeon.

Because this operation is of necessity performed upon patients who are poor surgical risks, it must of necessity carry a high mortality rate. In the hands of all operators this mortality has been from 10 to 15 per cent within the first 6 weeks, yet when we consider that most of these unfortunate patients are doomed to die of tuberculosis, we believe the hazard of the operation should be faced.

Up to date of this publication we have operated upon thirty-one different patients and have done fifty-eight operations upon them. We have only lost one directly from the operation. This was a one-stage operation and the man died of shock.

In all of our cases we have used local nerve block with novocain supplemented by nitrous oxide gas and oxygen analgesia. Each patient is given morphine, gr. $\frac{1}{6}$, and scopolamin, gr. $\frac{1}{300}$, an hour before operation.

As to results, our own cases are too recent to draw definite conclusions from, but Alexander has studied 1,024 cases operated (our cases are included in these) and found 32 per cent were cured and 26 per cent showed marked improvement; surely such hope held out to these unfortunates is ample argument for the operation of extrapleural thoracoplasty.

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THE PROGNOSIS OF TUBERCULOSIS IN INFANCY AND CHILDHOOD *

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The prognosis of tuberculosis in infancy and childhood differs in some respects from that of the adult and is dependent upon several important factors. It is affected by the age of the child, being proverbially bad the younger the infant and improving steadily with increasing age. A factor much more important than age is the localization of the process. If it remains confined to bronchial or mesenteric glands, there is decided possibility of complete healing of the process. If the skin, bones and joints, or the peripheral lymphatic glands are involved, the prognosis as regards life and function is always very favorable.

Tuberculosis of the pleura or of the peritoneum, while more serious, is not altogether bad. With present-day treatment complete healing and cure is effected in many of these cases. Tuberculosis of the intestine seldom heals. Miliary tuberculosis and meningeal tuberculosis are hopelessly fatal. The same is not quite true of tuberculosis of the brain substance proper. A certain proportion of these cases will recover.

The prognosis of tuberculosis in the infant under one year is today not quite so pessimistic as it formerly was. It is still extremely grave under six months but even for this age the mortality figures are decidedly lower than the ones formerly reported. While the mortality under one year of age is often quoted as high as 85 per cent, it lies nearer 50 per cent for the second year and is even better for the third and fourth years.

The tendency of tuberculosis to rapid generalization and dissemination in the very young infant is the fatal factor which determines the high mortality. This leads so easily to the miliary form or to meningeal tuberculosis.

The localization and the clinical course are, as in the older child, very important factors in the prognosis in the infant. Where the tuberculous process is confined to the lymphatic glands and the infant remains free from fever and continuously gains in weight, the outlook is very good. Particularly favorable cases are those in which the process only specifically affects the eyes, the skin, or the bones and joints.

Extensive involvement of the lung parenchyma or general involvement of the internal organs is grave and the issue, almost without exception, fatal. Peritoneal and intestinal tuberculosis is comparatively uncommon in the very young infant and is hardly seen before the third year.

Positive tuberculin reactions always mean active tuberculosis in the young infant. In the older child this is not the case. They always indicate the presence of tuberculosis but by no means decide the question whether the process is active or latent.

It is still a mooted question whether the offspring of tuberculous parents inherit a disposition to the disease. A preponderance of opinion inclines against this probability, although no accurate clinical observer will deny the fact that offsprings of tuberculous patients are ne'er-do-wells from the very beginning and respond with exasperating indifference to the most painstaking effort in care and feeding.

The principal cause of the development of tuberculosis in the infant is doubtless postpartum infection and disposition to it acquired through bad hygienic environment and the influence of intercurrent acute infectious diseases. The prognosis depends a good deal upon the source of the infection and the condition of the contact, particularly with reference to the possibility of constant reinfection. In this connection, the interesting observation has been made that the illegitimate infant has a far better prognosis than the legitimate, because he is certainly and easily removed from a tuberculous environment and in that way escapes the danger from constant reinfection by tuberculous parents.

Massiveness of infection and virulence of the bacilli are other factors which play no small role in determining the prognosis in infantile tuberculosis. The state of nutrition can easily deceive. The infant organism will often keep in good state of nutrition for a long time in face of an unfavorable prognosis. Persistent and prolonged temperature rises over 101-102°, if referable to the tuberculous infection, give the case a serious aspect.

The question whether infants who survive the infection present a specific tuberculous habitus and are more vulnerable to reinfection in later adult life is not fully decided; but again the preponder-

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ance of clinical observation seems to incline to the opinion that this is not the case.

In the older child the prognosis of tuberculosis is, with few exceptions, entirely favorable. It is particularly good between the ages of three and ten years.

Miliary, disseminated, generalized pulmonary, intestinal and meningeal tuberculosis are always grave at any age and generally terminate fatally but in all other forms the tendency is always toward healing and ultimate complete recovery.

In the prognosis of surgical tuberculosis, one must not forget that the external lesion is in all probability only a metastasis of an internal lesion. It is of paramount importance for the prognosis to be informed about the extent of the internal lesion and to determine whether you have closed or open tuberculosis.

Rollier[1] of Leysin reports a series of 450 closed cases, of which 393 healed and only five died. Of 200 open cases, 137 healed, twenty died and the rest remained stationary or were only slightly improved. These figures quite clearly indicate the difference in the prognosis of the closed and the open case of surgical tuberculosis.

Tuberculous glands of the neck quite commonly clear up. They may caseate and break down or they may calcify. Except for the cosmetic defect, the prognosis is good.

In the prognosis of bone and joint tuberculosis, one must approximately estimate the time factor. The prognosis is generally good but the cases run a long course. There seldom is recovery under three or six months. In some cases of spondylitis it may even last two years.

One of the drawbacks to certain and progressive recovery from surgical tuberculosis lies in the prolonged hospitalization of these cases and the neglect to stress diet and hygienic factors as is done in many of the other forms. Extensive pulmonary involvement often has taken place before complete inventory of the case has been taken. Feverish efforts are then made to place the child under ideal surroundings but unfortunately it may be too late.

Pulmonary tuberculous lesions determined solely by the roentgen ray generally permit a favorable prognosis. They often heal without any therapeutic aid.

If there is extensive tuberculous infiltration, the prognosis is much more grave and very grave if the tuberculosis is open. The outcome of most of the open cases eventually is fatal.

Tuberculosis of the hilus region offers a better prognosis than that of the apices or other parts of the parenchyma.

Pulmonary tuberculosis showing signs of consolidation is more favorable than the case showing moist râles.

Continued high pulse with persistent high temperature is a bad sign even if there is not much weight loss. Increase of leucocytes, especially eosinophiles, is generally a good sign. The prognosis of pulmonary tuberculosis is not so favorable near puberty as it is earlier in the child's life.

Tuberculous pleurisy is relatively infrequent in childhood. It is not often complicated by simultaneous pulmonary involvement. The prognosis is decidedly favorable. The most extensive pleural thickening may entirely disappear.

Peritoneal tuberculosis has a more favorable prognosis in the child than in the adult. It is bad during infancy and very early childhood but the disease is quite uncommon during this age. If the peritonitis develops rapidly, the prognosis is rather better than if the onset is gradual. The former is generally exudative, the latter probably adhesive in type. Low temperature is generally a favorable sign but cases do recover in spite of persistently high temperatures. Pronounced enlargement of the abdomen, increasing anemia, and the occurrence of edema are unfavorable signs and warrant a bad prognosis. A peritoneal tuberculosis which extends beyond a half year will probably heal.

Mesenteric gland tuberculosis tends to spontaneous recovery. Intestinal tuberculosis, on the other hand, is a gloomy chapter. If there are multiple ulcerations, the case will seldom live beyond a half year, although remissions may occur and the ultimate fatal outcome may be deferred for several years. Isolated ulcers may heal.

Perforation of an ulcer generally results in diffuse peritonitis with fatal termination, but a localized circumscribed abscess can form. This may perforate externally, generally near the umbilicus, and a fecal fistula results. Such a case frequently heals and may completely recover.

Miliary tuberculosis and meningeal tuberculosis are hopelessly fatal. The course is rapid and progressively bad. Meningeal tuberculosis is generally fatal within four weeks.

In the world literature there are isolated reports of recovery from both conditions. V. Bokay[2] collected reports of twenty-nine cases of healed

meningeal tuberculosis. Most of these cases complied with the most critical requirements and seemed therefore fairly authentic. The cases which recovered were all over two years and most of them beyond the seventh year. In spite of these few reports, it nevertheless is quite clear that the possibility of a recovery from either condition is an enormous exception.

Tuberculosis of the brain substance is not so fatal as the meningeal form. There is more possibility of healing and calcification of the processes.

Just what connection exists between adult tuberculosis and that of childhood is not yet quite clear. There is not enough evidence to prove that tuberculous infection in infancy and childhood, even if apparently recovered from, predisposes after all to reinfection in later adult life. The impression prevails that this is not the case and that tuberculous infection of early childhood once vanquished and healed leaves the organism rather more immune to the dangers of a new infection in adult life. It should be possible to prove this contention by careful observation and epidemiological study. The problem challenges investigation and should have the interest and attention of every clinician.

The prognosis of tuberculosis in infancy and childhood is more hopeful today than it ever was. If modern therapy is faithfully and intelligently carried out, it is good in the majority of cases.

1. Rollier: Die Sonnen Behandlung der Tuberkulose. Monatschr. f. Kinderh. 1913, 11, 357.
2. Bokay, V.: Uber die Heilungsmöglichkeit der Meningitis Tuberculosa. Jahrb. f. Kinderh. 1914, 80, 133.

"It was a common observation during the World war that, among the inhabitants of the countries participating, neurasthenia practically disappeared—simply because the people were so busy with war work that they had little time to think about themselves. To all of you who are victims of nerves, the lesson should be obvious: get work to do and do it with your whole heart; and in addition, cultivate a love of good books and music—do not confine your choice of reading to the sensations in the daily press or the highly colored trash with which the news-stands are filled, nor of music exclusively to 'jazz'; refrain from taking part in conversations which are more suited to the operating room and morgue than to social gatherings; cultivate a hobby. If you can not engage in one of the many sports, you may at least learn to walk and enjoy it. When walking, breathe deeply, keep your head up, look and listen. There are many things to be seen and heard by the pedestrian which escape the notice of occupants of rapidly moving motor cars." — Dr. Matthias Nicoll, Jr., Radio Health Talk No. 191.

TUBERCULOSIS AND PREGNANCY *

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This is a subject teeming with economic as well as medical significance. It is not only our duty to consider the rights of the child, and to take into consideration the ultimate welfare of the woman, but we must also consider her value to society and as a mother to other children.

Tuberculosis is one of the gravest complications of pregnancy, in spite of the fact that in many cases there is an apparent early improvement in the general condition of the pregnant tuberculous woman. She may put on fat and look and feel much better after conception, but this benefit is only apparent, is usually transitory, and even in those women surviving the labor and the puerperium death is usually hastened. *X*-ray pictures show that even while the woman is putting on fat and feeling better the pulmonary tuberculous condition is rapidly progressing. Ultimately an untimely end occurs in a large percentage of cases.

As early as 1850, Grisolle called attention to the deleterious effect of pregnancy upon the tuberculous, and Labert in 1872 observed that there was an increased death rate in pregnant tuberculous women. Ruehle in 1873 was the first to explain that there might be an apparent arrest of the disease early in pregnancy, only to be followed by a fatal termination soon after the birth of the baby. He further observed that the oftener pregnancies occur and the shorter the interval between them the surer it is to be fatal. Frederick Mueller in 1901 emphasized the danger of tuberculosis when women become pregnant and advised against marriage. Cornet called attention to the fact that tuberculosis often progressed to the acutest form after the puerperium, and Kanimer in fifty cases stated that there was an increase in the disease in 66 per cent of the cases, and the mortality was 24 per cent. Lobenstein of the New York Lying-in Hospital, analyzed one hundred cases as follows: "There was aggravation of the tuberculosis in every case. The so-called fibroid phthisis was the least affected. The severe cases all showed marked decline during the last three months of pregnancy, and in the advanced

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cases there was an exaggerated increase of all symptoms. Even in the mild cases 19 per cent died soon after delivery; in 50 per cent of the severe cases, 17 per cent died within one month after delivery, and an additional 2 per cent before the end of the third month. Seven per cent of the babies were stillborn, and 13 per cent died in the hospital. There was a marked aggravation of the disease in 84 of the 100 cases, and in only 16 per cent of the cases, namely, the fibroid phthisis, was there only a slight increase of the disease."

In Senator's clinic 66 per cent of tuberculous pregnant women were deleteriously influenced. Of twenty-three tuberculous women fourteen died during labor and seven within a few days after labor.

From the beginning of the study of this subject all statistics confirm the conclusion that pregnancy increases the tuberculous process in the lungs. While the general consensus of opinion is that the tuberculous should be forbidden to marry, and the married tuberculous should be forbidden to conceive, and that the pregnancy should be interrupted under certain conditions, there are on the other hand extremists both among obstetricians and specialists in tuberculosis who believe that the pregnancy should never be interrupted, while others on the other hand aver that pregnancy should always be interrupted, whatever the stage of the disease or the period of gestation. Either of these extremes is manifestly too radical. Those who think conservatively on this question believe that the pregnancy should be interrupted only in the mild or incipient cases of tuberculosis during the first three months of gestation, because these women can be saved for future usefulness to their families and to the community, and even for further childbearing.

In our experience the interruption of pregnancy after the first three months has not given us the desired results. Mild cases seen after the first three months may be allowed to go to viability or to term. Some believe that if growing worse the pregnancy should be interrupted, but according to our observations interruption of pregnancy after the third month is attended by such doubtful results that it is probably better to take the chances of the continuing pregnancy.

While tuberculosis is supposed not to be a frequent cause of abortion, Bernheim found that 23 per cent of 315 pregnant tuberculous women spontaneously aborted. Even if women are successfully delivered the puerperium seems to be the great danger period both to the mother and child. The tuberculous mother should not nurse her child because of the dangers of infection to the baby, and also on account of the tremendous nutritional tax upon the mother.

DuBois has very tersely summed up the question in the following words: "If a woman with phthisis marries she may bear the first accouchement well the second with difficulty, and the third never."

The pernicious influence exerted by pregnancy upon the tuberculous woman applies chiefly to the respiratory tract; local lesions in other organs are not so profoundly affected except in the cases of laryngeal tuberculosis. If pregnancy exerts such a baleful influence it seems to be a safe conclusion that a therapeutic abortion should be performed. However, in doing this we must realize that we are treading on dangerous ground; for we must meet not only religious convictions but the possibility of having our motives maligned, and the way opened for the unscrupulous to take advantage of a valuable procedure to cover their criminal acts. First of all it is not our function to attempt to combat the religious beliefs of anyone, and in taking into consideration the sacrifice of the life of the fetus the question must be approached conscientiously and according to the loftiest ideals of our profession, bearing in mind all of these objections and the honest differences of opinion in the profession. I do not hesitate to say that during the first three months of pregnancy therapeutic abortion in the interest of the patient, the family and the community, should be resorted to in the incipient and mild cases. For the sake of sounder judgment and protection of all concerned, at least two consultants should be called.

Bumm, of Berlin agreed that early mild cases should be aborted, but he asserted that "in advanced cases there is not much hope through an early abortion, but it may be done with the hope of doing the mother some good where she stands very little chance of going to term, for if the baby is born alive it will probably not survive long. Pottinger holds the same opinion, as do many others, but I am not impressed with their statistics. I am far from convinced that we are justified

doing a therapeutic abortion for anything else than for saving the mother's life. To undertake so grave and abhorrent a procedure as sacrificing the life of the fetus with only the remote hope of doing the mother some good, is, to say the least, a very doubtful procedure. The statistics offer so little proof that improvement may be expected except in early cases that I gravely doubt its justification in advanced tuberculosis or pregnancy much beyond three months. Of all the indications for abortion tuberculosis of the larynx is the most urgent, not only because of the very great danger to the mother, but the tuberculous process can sometimes be arrested. If in any case the patient goes to full term, labor, especially in the second stage, must be made as easy as possible, and during the third stage unusual care must be taken to save every drop of blood possible.

RESULTS TO THE OFFSPRING

Although tuberculosis seems not to predispose to abortion, 7 to 10 per cent of the babies are stillborn, 12 to 15 per cent die in the puerperium, rather high percentage of immediate fetal deaths. Even if the child lives it is exposed to three great dangers: (1) inherited tendency to tuberculosis; (2) danger of contracting the disease from its mother; (3) the possibility of having had it directly transmitted in utero. These figures show that we do not owe overmuch consideration to the fetus, for its chances at best are not good. Therefore, we owe more consideration to the pregnant tuberculous woman, to her family and to society. We should save the lives of as many mothers as possible. Therefore, we may be quite positive in our opinion that in mild cases of tuberculosis and in early pregnancy therapeutic abortion is usually indicated. In borderline cases beyond three months of gestation the procedure is doubtful, and in advanced pregnancy or advanced gestation very little hope of improving conditions can be entertained. Therefore, I have come to a very conservative position. I believe that every obstetrician should look upon therapeutic abortion as a procedure which should never be undertaken except under the most positive indications, and such indications in pregnancy complicated by tuberculosis I see only in laryngeal tuberculosis and in early cases of pulmonary tuberculosis in early pregnancy.

TUBERCULOSIS OF THE ORAL CAVITY *

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Tuberculosis of the mouth may involve any portion of its mucous membrane and extend to involve the bony structure of the mandible or maxilla. The process occasionally starts in dental caries or disease of the investing tissues of the teeth. Central tuberculosis of the maxilla or mandible of hematogenous origin results in osteomyelitis, necrosis with abscess and sinus formation. The salivary glands may become the seat of tuberculosis infection.

Tuberculous lesions of the mucous membrane occur in two forms—tuberculous ulceration proper and lupus. The lesions of lupus are usually associated with facial skin involvement, and develop very slowly, remaining superficial with little tendency to ulceration or destruction of the deeper tissues. Groups of tubercles form with subsequent scarring and contraction. About 10 or 15 per cent of patients with lupus present oral lesions. Lupus may have its beginning in the mouth, or, what is more frequent, in the mucous membrane of the nose.

Ulcerative oral lesions of tuberculous origin are probably more frequent than has been suspected. Past statistics were largely derived from necropsy findings and minute examinations of the entire oral mucosa were usually lacking. American statistics of von Ruck,[1] and Morrow and Miller[2] showed the tongue involved in somewhat less than 1 per cent of sanatorium and hospital patients. Though somewhat less common, ulceration of the cheeks, alveolar mucosa, floor of mouth, palate and lips, may occur and the probable percentage incidence among sanatorium and hospital patients is about one-half of one per cent.

TUBERCULOSIS OF THE TONGUE

Two hundred and eighty-two cases have been reported in the literature.[2] In most cases infection takes place by the invasion of the mucosa of the tongue by tubercle bacilli from the patient himself, from the contact of sputum, through the blood stream (miliary type), or from the extension of lesions of neighboring tissues. Though doubted by

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many authorities, the occurrence of primary tuberculosis of the tongue, though extremely rare, seems to have been proven conclusively at autopsy.

According to reported cases, most tongue lesions occur between the ages of forty and fifty, though the condition has been reported to develop at five and a half years and at eighty years of age. Men are far more frequently affected than women (five to one). This is attributed to pipe smoking, greater neglect of dental conditions and the holding of various things—nails, screws, etc., in the mouth.

Morrow and Miller describe three types of lesions: (1) *Nodular,* (a) superficial, and (b) deep; (2) *Ulcerative* (a) superficial, (b) deep, and (c) fissured; and (3) *Papillomatous* or *Warty.*

Most ulcers are preceded by a superficial nodule which often passes unnoticed by the patient until it breaks down and becomes painful and tender. This, the most common lesion, is usually superficial and may be small or very extensive. Its surface is usually covered with a yellowish grey mucus which on being wiped off reveals a granular surface, studded with reddish and yellowish elevated points. The margins of the ulcer are usually irregular and may be slightly undermined but not elevated nor indurated. Miliary tubercles at the edge of the ulcer are frequently seen. An area of erythema surrounds these superficial ulcers which may be multiple and later coalesce. These conditions tend to progress, gradually involving the deeper tissues with swelling and enlargement of the tongue.

Some ulcerative lesions tend to be fissured from the beginning and on the surface appear small; spreading apart the borders of the fissure may reveal deep, extensive and branching fissured ulceration.

The deep nodular forms show on palpation scattered areas of nodular infiltration covered by normal mucous membrane. These may go on to caseation without ulceration.

Papillomatous lesions of the tongue are rare and are more likely to involve the posterior portion of the dorsum, in the region of the circumvallate papillæ.

These lesions may occur in any part of the tongue, but seem to involve the dorsum, lateral borders and tip more often than the under surface or base.

The symptoms vary with the individuals, some complaining of marked pain, burning and tenderness, others apparently suffering but slight discomfort. With considerable involvement, pain, impaired mobility and salivation may be so marked as to interfere with eating and speaking.

Enlargement of the cervical glands is usually absent until ulceration has taken place. It is moderate in degree, and probably due in a measure to secondary infection. The tongue is naturally resistant to infection and its involvement usually occurs in late or terminal pulmonary tuberculosis. However, the occurrence of primary lesions and secondary lesions in unsuspected and relatively symptomless tuberculosis is sufficiently frequent to be made common knowledge. This has been emphasized by Ivy and Appleton.[3]

Tuberculosis of the oral mucous membrane presents similar characteristics to those already described in the discussion of lesions of the tongue. When affecting the region of the teeth and gums the appearance may be so modified as to obscure the diagnosis, particularly when the condition has come on after the extraction of teeth or in connection with injury of the alveolar tissues from faulty dental bridges or other restorations. Many cases are on record of the failure of extraction wounds to heal, subsequent ulceration, swelling, extension of the infection and delay in diagnosis. In children and young individuals such a condition may extend to involve the bone itself. Tuberculous periostitis and osteitis may go on to abscess formation and necrosis. Involvement of the maxilla may simulate antrum infection in its early stages. Later, the presence of sinuses and sequestration of bone along with chest findings clear up the diagnosis. Such maxillary involvements more often take place through the blood stream without local traumatism or apparent point of entry.

There are, then, two anatomical forms—one of alveolar origin, the other central. In the mandible, the alveolar portion and the region of the angle are most frequently affected. Tuberculosis of the mandible or maxilla may become superimposed on a pre-existing non-tuberculosis infection. In the early stages there is a hard, painful, non-fluctuating swelling involving the bone and overlying tissues. Later the pain and swelling increase with softening and abscess formation with similar involvement of the cervical glands. Sinuses appear which may lead to the bone itself or to a sequestrum. The course is slow and may take months or even years to reach such a stage. The *x*-ray may show both rarefaction and thickening.

Bony enlargements in the mouth, especially if accompanied by pallor of the gums and mucosa, are considered diagnostic of respiratory or circulatory disturbances by Kramer.[4] These conditions are allied to hypertrophic osteo-arthropathies and are of a *secondary nature.* Kramer has found enlargements of the alveolar process, bony processes of the jaws and hard palate in a high percentage of patients with pulmonary tuberculosis, the ratio increasing with the degree of pulmonary involvement. He states: "We have seen dentures displaced by this condition, and it often makes the proper fitting of them difficult. When the alveolar ridges are much thickened, extractions are made more difficult, and the thickening of alveolar ridges caused by this condition may be mistaken by the periodontist for hypertrophy caused by trauma or other irritation."

In observations on the effect of tuberculosis on the teeth, gums and jaws, Lester R. Cahn[5] draws the following conclusions: "Tuberculous disease can make itself manifest in the oral cavity, aside from tuberculous ulcerations and osteitis. These other lesions are: (1) Cervical cavities. (2) Gingivitis with loss of interdental papillæ, the space occupied by these papillæ being filled with a peculiar brownish sordes. (3) Large intertrabecular spaces revealed by the roentgenogram. This latter symptom is not always constant but occurs sufficiently often to be characteristic. Three illustrative cases are reported."

The diagnosis of tuberculosis of the oral cavity is by no means easy except when occurring in patients with established or advanced pulmonary tuberculosis. Lesions presenting in the apparently healthy must be differentiated from simple or traumatic ulceration, syphilis, carcinoma, etc. The history, clinical appearance, chest examination, serologic reactions, histologic examinations of excised tissue and animal inoculations may be necessary to clear up some cases. The general appearance, depth, edges, induration, pain and chronicity of the ulcer should be noted. The tuberculous ulcer is usually shallow, of granular surface with irregular margins. It is usually painful and tender and extends gradually.

Traumatic ulcers present an obvious local cause, such as a sharp carious tooth or defective dental restorations. Elimination of the trauma and oral sepsis result in prompt healing. It must be remembered that a traumatic ulcer may occasionally become infected by tubercle bacilli.

Syphilitic ulcers of the tongue are more frequent in the posterior portion and are, as a rule, deeper and present a more punched-out, ragged appearance, with little induration. The Wassermann reaction is positive in about 80 per cent of cases, and the therapeutic test of the administration of arsphenamin is usually conclusive. The coexistence of syphilis and tuberculosis must be kept in mind. The primary lesion of syphilis is more indurated, usually raised, and of short duration.

A carcinomatous ulcer is usually solitary and deeper, presenting irregular, raised, everted edges with marked induration. It is frequently associated with leukoplakia. Tuberculosis of the mouth and carcinoma occur at the same age, in the same locations and in the same sex. (This similarity is not generally known.) Epithelioma of the tongue must be diagnosed promptly to afford chance of cure.

The ulcerative lesions of ulcerative stomatitis, herpetic stomatitis, Vincent's stomatitis, erythema multiforme, foot and mouth disease, would rarely be confused with tuberculosis on account of the acuteness of their onset, more rapid course, earlier glandular involvement, and associated systemic or cutaneous symptoms.

Actinomycosis involving the teeth, alveolar process, central portions of the jaws and the investing tissues may simulate tuberculosis of the same regions. Examination of the exudate and the finding of the ray fungus makes the diagnosis of actinomycosis positive.

Clinical, chest and serologic examinations may leave a considerable proportion of tuberculous oral lesions undiagnosed. It may be necessary to excise the entire lesions for histologic examinations. By this means it is still at times impossible to differentiate tuberculosis from syphilis unless special staining methods for the tubercle bacilli are employed or an emulsion of a portion of the excised lesion is injected into guinea pigs. The recovery of tubercle bacilli from lesions in the guinea pigs is conclusive.

Tuberculosis involving the mandible or maxilla must be diagnosed from the more common forms of periostitis, osteomyelitis, necrosis, benign tumors of the odontome group, central giant cell tumors, sarcoma or carcinoma. Complete physical examination, laboratory and serologic tests are essential and the possibility of coexisting pulmonary tuber-

culosis and other lesions must be ever kept in mind. Lesions of the alveolar mucosa may come on after the extraction of teeth. The tooth sockets do not heal completely and soreness persists. Later, the characteristic "mouse eaten" appearance is noted. This clinical course should be kept in mind by the dentists, particularly those taking care of tuberculous patients.

Tuberculosis of the salivary glands must be diagnosed from chronic suppuration, calculus, von Mickulicz's disease, mixed tumors, carcinoma, actinomycosis, syphilis, lymphadenitis, cellulitis, etc.

TREATMENT

As most oral lesions occur in advanced pulmonary cases, the final prognosis is usually hopeless. Some observers feel that local treatment is of minor importance and lay great stress upon the general antituberculosis regime. Others report the cure of small oral lesions by excision, with prolongation of the patient's life and relief of pain and discomfort. In extensive lesions the cautery may be of some value. *X*-ray therapy, and Kromayer light advocated by some are found useless agents by others. Tuberculin therapy is advocated by Von Ruck, White and Marcey. The local application of antiseptics, such as dichloramin-T may be of service. The application of phenol and other cauterizing fluids is condemned. In secondary localized lesions without extensive chest involvement and in the rare primary lesions excision and sanatorium treatment may result in complete cure of the patient. Primary tuberculosis of the oral cavity presents the greatest possibility of cure by complete excision of the lesion followed by rest, nourishing food, etc.

Lesions of the alveolar process and jaw may require wide exploration, curettage and cauterization. This may of necessity be repeated at intervals over a year or more before final healing takes place. General systemic treatment is necessary to effect a cure. When occurring during the period of dentition, as is usually the case, teeth may be involved and lost during their formative period with consequent impairment of growth of the jaws, deformity and dental disability.

CONCLUSIONS

1. Tuberculous lesions of the mouth and jaws are more frequent than is generally supposed.
2. The ulcerative type rarely develops in a clean healthy mouth.
3. Tuberculous lesions of the lip, cheek, alveolar process or tongue may *precede* the onset of frank symptoms of pulmonary tuberculosis and be of diagnostic importance.
4. With the teeth and investing tissues made healthy by dental treatment and care, complete healing of localized tuberculous ulcerations may be expected after complete excision in both advanced and incipient pulmonary involvement.
5. The general therapy of the oral lesions is essentially that of tuberculosis of other parts of the body.

REFERENCES

1. Von Ruck: Laryngoscope, 1912, 122, 1190.
2. Morrow and Miller: Jour. Am. Med. Assn., Nov. 8, 1924, 83, 1483.
3. Ivy and Appleton: Jour. Am. Med. Assn., Nov. 3 1923, 81, 1483.
4. Kramer: Am. Dent. Assn. Jour., Sept., 1925, 12, 1117
5. Cahn: Dent. Cosmos., May, 1925, 67, 479.

MINNESOTA MEDICINE

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EDITORIAL

Immunization Against Diphtheria and Scarlet Fever Without Serum Sensitization

From the clinical observations of Bretonneau (1821) together with the discovery of the diphtheria bacillus by Klebs in 1883 and its isolation by Loeffler in 1884 combined with the study of the toxin produced by this bacillus by Roux and Yersin (1888) the clinical entity and etiology of diphtheria was established. After long experimenting Behring (1890-94) and others found that the serum of animals immune to diphtheria was a valuable remedial agent in the treatment of the disease. Since the introduction of diphtheria antitoxin the mortality of diphtheria has decreased from 55 to 6 per cent and lower. Trousseau, the father of modern tracheotomy, popularized this operation and devised the double tube now in use. The high mortality provoked a bitter opposition to this operation which persisted until 1880, when O'Dwyer, influenced by this high mortality, began his investigations on intubation which resulted in one of the greatest American contributions to pediatrics, namely the intubation tube. The next important contribution was the development of the Schick test in 1913 by means of which susceptible individuals might be detected. About 1895 Babes and Park independently began the use of injections of toxin-antitoxin mixtures to immunize animals for the production of antitoxin. In 1907 Theobold Smith suggested the possibility of producing immunity to diphtheria in man, which was finally accomplished safely by von Behring in 1913. Since that time, especially recently, a rapidly increasing number of children have been immunized against diphtheria by the administration of toxin-antitoxin. This procedure sensitizes these individuals to horse serum, and subsequent injections of various serums such as antitetanic, scarlatinal, antistreptococcic and the other serums derived from horses may possibly result in anaphylactic reactions. Several such instances are recorded in the literature. It is advisable, therefore, in administering serums to children previously immunized against diphtheria by injections of toxin-antitoxin mixtures, to attempt to avoid anaphylaxis either by desensitization of the patient by means of an initial injection of a very small amount of serum one hour previous to giving the entire dose, or by adding one c.c. of 1:1000 adrenalin solution to the serum immediately before it is administered. In addition a hypodermic injection of appropriate dosage of atropine sulphate may be of value in avoiding anaphylactic reactions.

As a result of recent investigations at the University of Minnesota a method is being developed by which children may be immunized against diphtheria and also against scarlet fever without being sensitized to serum. This indeed is a most valuable contribution which promises to enable the medical profession to be able to protect their patients against these serious diseases without rendering them anaphylactic to serum. The advisability of the avoidance of sensitization against horse serum evidently has been recognized by certain commercial concerns who are now using goat serum in their toxin-antitoxin preparations.

C. A. S.

The New Constitution

The Minnesota State Medical Association has been operating under a constitution adopted in 1914. As many of its provisions have become obsolete and as new conditions have arisen which should be provided for, the Council decided to have it revised and brought up to date. This revised constitution will be presented at the next state meeting for action by the House of Delegates.

One of the changes which we wish to discuss and which has been endorsed by the Ramsey County Medical Society is the formation of a Committee on Public Health Education. There is a present need for the proposed Public Health Committee in correlating the work of public health activities throughout the state and our profession. This need is likely to increase rather than diminish in the future and wise counsel will work to the mutual advantage of the public and the profession.

We feel that a number of years of careful scientific training are necessary to fit a man to practice medicine. We as a profession are slow to adopt new methods and cures until they have been proven adequate beyond the shadow of a doubt. To the public this slow scientific method is incomprehensible. That is why they rush to fraudulent patent medicines. That is why they put down our view of osteopaths and chiropractors as mere jealousy. How they look upon the cults is shown by statistics which indicate that irregulars in Wisconsin number 50 per cent (in Minnesota 20 per cent) of the medical profession. We consider it part of our duty to protect people (so far as they will let us) from harmful medication and incorrect diagnosis. But why not help both them and ourselves by taking them more fully into our confidence? The work of this new committee will be to help the average man and woman by means of better health education. This is not the task of a year; it is one of a lifetime. The Council firmly believes that steady persistent effort will in time convince people that our effort, as individuals and as a society, is directed scientifically toward making and keeping them well.

What are the lines of activity suggested? First, to encourage each county medical society to conduct annual public medical meetings. The variety of medical moving pictures that may be rented for a nominal sum from two New York firms is surprising. Surgical, medical and general public health matters are listed. If each county society puts on a public meeting to include a movie, *x*-rays of the entire body, and two or three short talks on such subjects as cancer, immunization and tuberculosis, one could feel assured that those attending would go home with a more intelligent viewpoint of the medical profession.

This year our radio committee has put on an exceedingly instructive course of public health talks, and their efforts are well worth while. The profession is entitled to use for itself all legitimate advertising channels,—to use them not for individuals but for the organized body of doctors.

Further, this new committee is to take measures to eliminate from newspapers throughout the state all fraudulent medical advertising. In this respect Minneapolis has a fine record; its two leading newspapers are free from quackery. Recently the Sunday issue of a prominent newspaper in another city in Minnesota displayed twenty-three medical advertisements, half of them fraudulent.

The last and perhaps most difficult duty of the committee deals with the abuse of free clinics by those amply able to pay for medical attention. The enthusiasm of laymen in building up a huge health service has in many instances gone beyond reasonable limits. Many women in St. Paul, for instance, feel as much at liberty to take their babies to the free clinic as to use the public library. From comments heard this sort of thing is not limited to the cities. If the functions of this committee are properly carried out so that from the medical standpoint these agencies are properly administered, we shall have less paternalism and less state medicine. It is estimated that in the St. Paul Baby Welfare Clinic 30 per cent of the babies of St. Paul receive free service, while 10 per cent is a fair estimate of the number properly entitled to such services.

The section of the new constitution dealing with this committee is as follows:

> Sec. 5. The Committee of Public Health Education shall consist of 5 members or as many more as the Council may determine. Its function shall be: 1st, to strive to develop an intelligent public viewpoint toward the medical profession; 2nd, to co-operate with the various agencies throughout the state whose function is the promotion of public health, and whose governing bodies are composed in whole or in part of laymen, so that from a medical standpoint these agencies shall be intelligently administered; 3rd, to use such measures throughout the state as may be necessary to eliminate fraudulent medical advertisements from the public press; 4th, to aid and encourage each component society to conduct at least

one annual public medical meeting; 5th, to encourage public health educational matters through the channels of the public press, radio, movies and the lecture platform.

The Modern Hospital

The modern hospital is a different institution from that of a generation ago. It will doubtless undergo certain modifications during the next generation.

Most private hospitals have been established on a semi-philanthropic basis. Expensive to administer, absolutely necessary in time of emergency, they have in the majority of instances been endowed, and are managed by trustees for the benefit of the people in the locality. Seldom run for profit they are able to operate at much lower rates than would otherwise be possible.

The Class A hospital must have certain equipment in the way of *x*-ray apparatus, laboratory and personnel which materially increases the cost of operation. The recently adopted twelve-hour nursing schedule further increases hospitalization expense in certain instances. This is all very well for the well-to-do patient but the increased cost of being sick in hospital is a distinct hardship to those of limited means who make up the great majority of patients.

The hospital, like everything else of value in this world, comes in for a certain amount of abuse. The unnecessary hospitalization of patients is probably the most outstanding. Physicians succumb too often to the temptation to hospitalize patients for their own convenience. Many patients can be taken care of just as well at home and when the added expense of hospital care is forced upon a patient unnecessarily the physician has lost sight of the golden rule. We are not referring to borderline cases which are subject to difference of professional opinion. Obstetrical and most operative cases require hospital care. Unnecessary hospitalization, however, accounts more than any other one factor for American cities being so generally oversupplied with hospital beds.

The medical staff of the modern hospital might save themselves and also their patients considerable expense by more co-operation. Instead of each staff member investing in expensive surgical, diagnostic and therapeutic apparatus the hospital might well make the investment to the mutual benefit of the patient, hospital and doctor. The present widespread practice among physicians of purchasing physiotherapy apparatus of limited value, too often from an honest fear of being unprogressive, and then using the apparatus for the thousand and one conditions for which it is recommended, is a poor practice. The newly proposed Council on Physiotherapy of the A. M. A. should help in standardizing the real value of the recent additions in physiotherapy. They have a limited value, and group use in a hospital is probably the solution of the present problem.

Much is heard nowadays about the passing of the old fashioned family doctor. The average graduate of today is a better informed doctor than the average a generation ago. There is no doubt but that patients today are being cared for by physicians with better general training than ever before. The hospital with its close professional contact in daily routine and in attendance at staff meetings affords the general practitioner a means of becoming a broader man and keeping up with progress in medicine.

We have tried to picture how the modern hospital can and in many instances is working in a broader way to the benefit of medical practice. Physicians through their influence as members of a staff can assist in developing the larger usefulness of the hospital and at the same time in keeping down the expense of hospital care.

Glen Lake Sanatorium

Last June the members of the Hennepin County Medical Society held a meeting at the Glen Lake Sanatorium, Oak Terrace, Minnesota, and listened to a symposium on tuberculosis presented by physicians and surgeons of the sanatorium staff. This symposium dealt with tuberculosis in its various phases and we are glad to devote this entire issue of the Journal to the publication of these papers. Nothing very new on the subject of tuberculosis is herewith offered. The papers give a good idea, however, of what is going on at this fine county sanatorium.

Tuberculosis mortality has shown a distinct decrease in Minnesota as a whole since 1918. We have no figures showing the morbidity rate, but presumably that has also decreased. Until 1918 there was no demonstrable improvement in the death rate from tuberculosis. It was not until 1913 that the county sanatorium law went into

effect and the full effect of this venture in state medicine has undoubtedly not made itself felt.

Tuberculosis still demands a serious toll from the citizens of our state and it is in the interest of carrying on unrelenting warfare against the white plague that this issue of MINNESOTA MEDICINE is being devoted.

OBITUARY

DR. A. J. GIBSON

Dr. A. J. Gibson was born in Stornoway, Scotland, July 1, 1870. He came to Duluth from Scotland in 1884 and took his high school course at the Duluth high school. Later he returned to Scotland and entered the study of medicine at Edinburgh.

After finishing his undergraduate course, he became a clinical assistant at the Royal Ophthalmic Hospital and also in the Great Northern Central Hospital, London; in the Quinze-Vingt Hospital, Paris, and later under Professors Killian and von Eicken, of Freiburg, Germany.

When the Boer war broke out he joined the British forces in South Africa and served during the period of that war. Later he entered private practice in Eye, Ear, Nose and Throat, first at Durban, then in Transvaal, South Africa.

After four years, he returned to England, then came to Canada and established himself at Victoria, British Columbia, working in a special field. In 1915 he joined the Canadian forces with captain's rank and went to Salonika.

After the World war, he settled in Duluth in the practice of his specialty, but was compelled to discontinue after a short period on account of his health. He returned to Scotland and died at Creetown on August 18, 1925.

He was married in 1900 to Augusta Mildred Goslin of London, England. He is survived by his wife, one daughter, Barbara, a son, George, four brothers and two sisters, two of whom are Mr. Murdo Gibson and Mrs. John MacLeod of Duluth.

DR. E. F. CONYNGHAM

News has been received of the death of Dr. E. F. Conyngham of Underwood, which occurred Saturday, February 13, at the University Hospital, Minneapolis.

Dr. Conyngham was born in the state of Missouri, May 8, 1865, being sixty years old at the time of his death. He was a graduate of the Medical School of the University of Minnesota, of the class of 1886.

Dr. Conyngham had been practicing at Underwood since 1922. He was an honorary member of the Park Region District Medical Society.

Dr. Conyngham is survived by a daughter, Katheryn, a son, Edward, and a sister.

REPORTS AND ANNOUCEMENTS OF SOCIETIES

LYMANHURST STAFF MEETING

At the regular monthly meeting of the medical staff of the Lymanhurst School for Tuberculous Children the following program will be presented at 7 o'clock Tuesday evening, March 23, 1926, at the Lymanhurst School, 1800 Chicago Avenue, Minneapolis:

"Roentgenologic Observation of Unusual Pulmonary Conditions." Dr. Leo Rigler.

"Some Considerations in the Prevention of Heart Disease." Dr. M. H. Nathanson.

"The Acoustics of the Bronchial Breath Sounds, and Its Application to the Phenomena of Auscultation as Heard in Lobar Pneumonia." Dr. George Fahr.

"Employment of Operations to Reduce Disability Rather Than to Postpone Death." Dr. John L. Yates of Milwaukee.

All persons interested in tuberculosis are invited to attend these meetings and participate in the discussions.

UPPER MISSISSIPPI MEDICAL SOCIETY

At the last annual meeting of the Upper Mississippi Medical Society, held January 30, 1926, the society went on record as being in favor of raising the state dues to such amount as is necessary not to exceed $15.

Dr. H. M. Johnson, president of the State Association, attended this meeting.

OF GENERAL INTEREST

Dr. J. T. Schlesselman of the Mankato Clinic is spending three months abroad, doing post-graduate work in eye, ear, nose and throat diseases, in Vienna.

Dr. Henning F. Wiese, formerly with the Sivertsen Clinic, Minneapolis, has opened his own offices at 701 Physicians and Surgeons Building, Minneapolis.

Dr. Macnider Wetherby has announced the opening of offices in the La Salle Building, Minneapolis, for the practice of internal medicine and diagnosis.

Dr. H. G. Wood of the St. Paul Clinic, St. Paul, returned to the Mayo Clinic, Rochester, the first of this month, where he will be associated with the medical department.

Dr. J. H. Beaty of St. Cloud is doing post-graduate work in gynecology and obstetrics at Tulane University in New Orleans. He expects to return about the first of April.

"Physical Therapeutics" is the name which has been selected for the former "American Journal of Electro-Therapeutics and Radiology," published in Baltimore, Maryland. The change in names became effective with the February number.

The Society of Experimental Biology and Medicine meets the first Wednesday of each month in Millard Hall, and the secretary, Dr. F. H. Scott, will be pleased to send programs of each meeting to any physician in the Twin Cities who asks for it.

The Physiological-Pharmacological Seminar of the Medical School meets each Tuesday during the school year in the Faculty Room, Millard Hall, at 12:30. Coffee is served and members bring their own sandwiches. Members of the medical profession will be welcome at these meetings.

Dr. L. M. Lowe has disposed of his practice at Glyndon, where he has been located for the past twenty years and is now engaged in post-graduate study at Tulane University, New Orleans. Dr. Lowe expects to return to Minnesota in the spring, when he will engage in general practice in Minneapolis.

On March 30, at 4:30 P. M., in the Chemistry Auditorium, University of Minnesota, Dr. E. F. Burton of the Department of Physics of Toronto University will lecture on "The Physics of the Ultra Microscope; Its Structure and Use and the Optical Properties of Suspended Particles and Colloidal Cells." This is a lecture in the colloid series conducted by the Graduate School for which noted authorities are brought to the University.

STATE HEALTH DEPARTMENT TO SUPPLY DIPHTHERIA TOXIN-ANTITOXIN AND MATERIAL FOR THE SCHICK TEST FREE OF CHARGE

The Minnesota State Sanitary Conference requested the State Health Department to secure toxin-antitoxin and material for the Schick test for free distribution throughout the state in the line of the distribution of diphtheria antitoxin.

The statistics for the past seven years show that no further reduction of diphtheria cases and deaths may be expected until toxin-antitoxin is generally used.

MINNESOTA'S DIPHTHERIA 1918-1924

28,852 cases; 1,667 deaths; fatality rate, 5.77 per cent.

	Cases	Percentage of All Cases	Deaths	Percentage of All Deaths	Percentage Fatality
Under 1 yr.	355	1.23	53	3.1	14.92
*Under 5 yrs....	4,220	14.63	610	36.63	14.45
5-9 yrs.	8,210	28.46	511	30.69	6.22
10-14 yrs.	5,489	19.02	215	12.91	3.91
15-19 yrs.	2,649	9.18	87	5.23	3.28
All others	8,284	28.71	244	14.54	2.94

*Includes group "Under 1 yr."

Year	Cases	Deaths	Fatality Rate	Mortality Rate per 100,000
1918	3,674	282	7.7	12.3
1919	4,541	302	6.6	12.9
1920	3,616	243	6.7	10.3
1921	4,380	220	5.0	9.03
1922	4,270	192	4.5	7.74
1923	4,430	210	4.7	8.40
1924	3,941	218	5.8	8.61

The Department of Administration and Finance is now making arrangements for supplying toxin-antitoxin and material for the Schick test to be distributed free of charge by the State Health Department.

Dr. H. M. Johnson, president of the State Medical Society, had the whole proposition thoroughly discussed by the proper committees of the association, who enthusiastically indorsed the State Board's program. In counties where no organized campaigns for toxin-antitoxin work have been started, the matter will be taken up with the county and district medical societies by the State Board of Health. The secretaries of the county and district societies will receive a letter shortly giving the complete outline of the program discussed with Dr. Johnson.

The Board feels that the supply of toxin-antitoxin should be made available not only to health departments and school boards who will conduct organized work in the schools, including, of course, children under school age, but also to physicians for use in their private practice. It is obvious that the family physician is in a position to reach the very young children who have the greatest susceptibility to diphtheria. The fact that during the past seven years nearly 37 per cent of all the deaths from diphtheria have occurred in children under five years of age emphasizes the part the family physician will play in the eradication of diphtheria through toxin-antitoxin immunization.

MEDICAL STUDY TOUR TO EUROPE

The Travel Study Club of American Physicians, founded at the London International Medical Congress of 1913, is announcing plans for its 1926 Study Tour. Sailing from New York on June 12, the party will visit clinics and medical institutions in the medical centers of Oslo (Christiania), Stockholm, Copenhagen (optional to Berlin and Munich), Cologne, Heidelberg, Strasbourg, Berne, Zurich, Leysin, Geneva, Paris and London, returning on August 8. Dr. Louis L. Seaman of New York is president, Drs. Fred H. Albee of New York, Edward B. Heckel of Pittsburgh, John P. Lord of Omaha, vice presidents. Physicians in good standing, to the limit of fifty, are invited to participate in this tour, and the secretary, Dr. Richard Kovacs, 223 East 68th Street, New York City, will supply any further information desired.

THE ANEMIAS DUE TO RADIOACTIVE SUBSTANCES

Reports have been published on the dangers of radioactive substances and warn against subtle menaces that represent practically a heretofore unrecognized form of occupational poisoning. These reports bring out that the ingestion of radioactive substances may act as irritants to the adjacent erythroblastic and leukoblastic centers and may produce a severe anemia and stimulate pernicious anemias of the regenerative and aplastic types. The demonstrated cell-destructive potency of radioactive substances and the unsuspected late effects which they may initiate should serve as a vigorous warning to all who promote radioactivity as a therapeutic measure. (Jour. A. M. A., Jan. 9, 1926, p. 121.)

NEW AND NON-OFFICIAL REMEDIES

TRUTH ABOUT MEDICINE

Special Pertussis Vaccine.—A pertussis bacillus vaccine (New and Non-official Remedies, 1925, p. 353) marketed in 5 c.c. vials. Cutter Laboratory, Berkeley, Cal.

Coco-Quinine.—Each 100 c.c. contains quinine sulphate 2.19 gm. (10 grains per fluid ounce), suspended in a syrup flavored with chocolate, yerba santa and vanillin, and containing sodium benzoate, 0.18 gm. per 100 c.c., and alcohol, 4 per cent. Eli Lilly & Co., Indianapolis.

Concentrated Culture of Bacillus Adicophilus-P. D. L.—A milk culture of *Bacillus acidophilus* supplied in vials containing 8 c.c. It contains not less than 300 million viable organisms *(B. acidophilus)* per c.c. at the time of sale. For a discussion of actions and uses, see Lactic Acid-Producing Organisms and Preparations (New and Non-official Remedies, 1925, p. 191). Physicians Diagnostic Laboratories, Berkeley, Cal. (Jour. A. M. A., Jan. 2, 1926, p. 37.)

Scarlet Fever Streptococcus Antitoxin Concentrated.—A scarlet fever streptococcus antitoxin (Jour. A. M. A., May 2, 1925, p. 1338) prepared by the method of Drs. Dick by license of the Scarlet Fever Committee, Inc. It is marketed in packages of one syringe containing 6 c.c. (prophylactic dose) and in packages of one syringe containing 12 c.c. (therapeutic dose), E. R. Squibb & Sons, New York.

Scarlet Fever Immunity Test.—The toxin of the hemolytic streptococcus of scarlet fever is used to determine those persons who are susceptible to scarlet fever. The toxin is first standardized on human beings and diluted so that 0.1 c.c. represents a skin test dose. The test dose is injected intracutaneously on the forearm and the degree of susceptibility is determined at the end of from 22 to 24 hours. The toxin is used also for active immunization. For this purpose it is injected subcutaneously at weekly intervals; from three to five doses of increasing strength are given.

Scarlet Fever Streptococcus Toxin for Dick Test-Squibb.—It is prepared by the method of Drs. Dick by license of the Scarlet Fever Committee, Inc. Marketed in packages of one vial containing sufficient toxin for ten tests; in packages of one vial containing sufficient toxin for 100 tests. E. R. Squibb & Sons, New York.

Scarlet Fever Streptococcus Toxin-Squibb.—It is prepared by the method of Drs. Dick by license of the Scarlet Fever Committee, Inc. Marketed in packages of five vials of toxin containing increasing doses; in packages of fifty vials, representing ten immunizations. E. R. Squibb & Sons, New York.

Sulpharsphenamine-Mallinckrodt.—A brand of sulpharsphenamine (New and Non-official Remedies, 1925, p. 55). It is marketed in ampules containing, respectively, 0.1, 0.2, 0.3, 0.4, 0.5 and 0.6 gm. Mallinckrodt Chemical Works, St. Louis. (Jour. A. M. A., Jan. 16, 1926, 199.)

PROPAGANDA FOR REFORM

Trepol and Neotrepol Not Acceptable for M. N. R.—The Council on Pharmacy and Chemistry reports that Trepol and Neotrepol, bismuth preparations for use in the treatment of syphilis, marketed by the Anglo-French Drug Co., are not acceptable for New and Non-official Remedies. Trepol, offered in the form of ampules claimed to contain basic tartrobismuthate of potassium and sodium, was rejected because the product does not represent a "tartrobismuthate of potassium and sodium" but is instead substantially a basic bismuth tartrate, and because no adequate tests for the control of its identity and uniformity are furnished. Neotrepol, supplied in the form of ampules containing metallic bismuth in suspension, was rejected because the amount of active ingredient claimed to be contained in the ampules is not in accord with the amount declared to be present. (Jour. A. M. A., Jan. 9, 1925, p. 135.)

Some More Medical Frauds.—The postal authorities have recently barred a piece of asthma cure quackery and two lost manhood fakes from the use of the mails. The first is the Asthma-Tab Laboratories, Inc., of Kansas City, Mo., which exploited a product to the public, shown by the A. M. A. Chemical Laboratory to be essentially potassium iodide and arsenic trioxide. The two lost manhood concerns were Hart & Co., which put out a device called the Perfection Developer, and B. & V. S. Manufacturing Co., which exploited the "Burt Vacuum Tube." (Jour. A. M. A., Jan. 16, 1926, p. 218.)

Vitalait Starter Omitted from N. N. R.—The Council on Pharmacy and Chemistry announces that Vitalait Starter of the Vitalait Laboratory, Newton Centre, Mass., has been omitted from New and Non-official Remedies because the preparation was used as a means of advertising an unacceptable preparation. (Jour. A. M. A., Jan. 23, 1926, p. 294.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting November 12, 1925

The Minnesota Academy of Medicine held its regular monthly meeting at the Hotel Kahler, Rochester, Minnesota, on Thursday evening, November 12, 1925.

The meeting was called to order by the President, H. L. Ulrich. There were 45 members and 22 visitors present.

The minutes of the October meeting were read and approved.

President Ulrich introduced the speakers and called upon Dr. John Fulton, the first president of the Academy, who opened the program.

DR. FULTON: I thank our President, Dr. Ulrich, for giving me the opportunity to express my very keen appreciation, and I know I am expressing similar sentiment for every member of the Academy to Dr. Judd for the invitation and the honor which he has conferred upon the Min-

nesota Academy of Medicine to meet with this magnificent Clinic, one of the greatest in the world.

This Society was organized about forty years ago, in the West Hotel, Minneapolis. The original membership consisted of twenty members each, from St. Paul and Minneapolis, thus demonstrating that the medical profession of the Twin Cities was harmonious then, as they are now, and practice together in peace and happiness, without the exercise of continuous jealousies.

The history of this Academy has recently been written in a very interesting, thorough and satisfactory way by Dr. Arthur S. Hamilton and published by Dr. Jones in a recent number of The Journal-Lancet, but as I have already said to our presiding officer, we are here to listen to this splendid program. It is dangerous to ask a man of my age to make an after-dinner speech on account of the temptation to reminisce, which might take up all the time allotted to us, so safety consists in commencing immediately with the program.

The scientific program consisted of the following reports:

1. Dr. H. S. Plummer—The Use of Iodine in the Treatment of Exophthalmic Goitre.

2. Dr. W. E. Sistrunk—Operation for Thyroglossal Duct Cyst. Discussion by Dr. Arnold Schwyzer, St. Paul.

3. Dr. Chas. Sheard and Dr. J. L. Bollman—Studies in Liver Function. (With lantern slide demonstration.) Discussion by Dr. Hilding Berglund of Minneapolis, and Dr. L. G. Rowntree of Rochester.

4. Dr. E. C. Rosenow—Studies in Poliomyelitis.

5. Dr. E. C. Kendall—Progress in Study of Thyroxin. (With lantern slide demonstration.)

6. Dr. W. L. Benedict—The Ophthalmoscopy of Clifford Allbutt.

On motion meeting adjourned.

JOHN E. HYNES, M.D.,
Secretary.

Meeting of December 9, 1925

The Minnesota Academy of Medicine held its regular monthly meeting at the Town and Country Club on Wednesday evening, December 9, 1925, at 8 o'clock. There were 38 members and 1 visitor present.

The meeting was called to order by the Vice President, Dr. F. E. Burch.

Dr. L. E. Daugherty (St. Paul) reported two cases, as follows:

1. A case of rupture of the tendon of the long head of the biceps muscle.

G. L., section laborer, married, 37 years of age. On November 2, 1925, he lifted a big piece of ice. The forearms were flexed at a right angle. He felt a sudden acute pain in the region of the right shoulder and upper arm. He continued working but the pain in the right shoulder persisted and he noticed some deformity of the right biceps muscle. He stated that the right arm was weaker than the left, particularly in the motion of flexion.

Examination showed a well-developed man. When the right arm was flexed there was a noticeable deformity of the biceps muscle. A hard indurated area about two inches long could be felt in the outer and upper margin of the muscle.

Operation: An incision was made over the anterior part of the upper arm. The tendon sheath was opened, and the tendon was found turned around in the sheath so that the injured end was near the muscle. It seemed to have been torn from its point of insertion. By splitting the pectoral muscle in front of the deltoid, the coracoid process was exposed. The tendon of the long head was passed through the short head of the biceps and sutured to it and was then attached to the coracoid process.

This method copies the one used by Dr. E. L. Gilcreest in the last transactions of the Western Surgical Association.

2. A case of tuberculous empyema apparently cured following thoracoplasty.

J. B., female, age 22 years. Father died of "nephritis." Mother living and well. Three brothers living and well; one brother died of "heart disease"; one brother accidentally killed. Three sisters living and well. No family history of tuberculosis.

Past history: Patient was always well until the summer of 1919, when she began to tire easily. In April, 1922, shortly after a pulmonary hemorrhage, she was admitted to the service of Dr. Geer at the Ancker Hospital. At that time an advanced tuberculosis of the upper right lung was found and the sputum contained numerous tubercle bacilli.

On May 11, 1922, artificial pneumothorax was induced and a good collapse was obtained followed by relief of symptoms. There was a slow gain in weight and the sputum became negative.

In December, 1922, there was evidence of an effusion in the right chest which increased in volume. There were no symptoms at that time and the sputum remained negative.

In July, 1923, in spite of the effusion in the right chest, there was no temperature and she was allowed to go home for a vacation. The sputum was still negative for tubercle bacilli.

In November, 1923, there was a return of daily temperature and one day, while eating candy, a severe choking and coughing spell raised a cupful of sweetish purulent material.

On March 24, 1924, it was necessary for her to return to the hospital and a right pyothorax with a bronchial fistula was found. On aspiration, the fluid contained tubercle bacilli but no other organisms. Repeated aspirations and injections of formalin and methylene blue, by Dr. Geer, did not affect the effusion and the bronchial fistula remained open.

I first examined this girl in October, 1924, when the above condition was present. There was some cough; the general condition was fair; weight about 96 pounds, and temperature 100. An *x*-ray of the chest showed a complete collapse of the right lung with considerable fluid in the right thoracic cavity.

On October 30, 1924, under local and gas anesthesia, the first stage of an extra-pleural thoracoplasty was done and the 10th, 9th, 8th, 7th, 6th, and 5th ribs were resected. The patient made a good recovery, and on November 15, 1924, the second stage of a thoracoplasty was performed and the 4th, 3rd, 2nd, and 1st ribs were resected. Again there was

an uneventful recovery and an *x*-ray of the chest showed about a 50 per cent reduction of the right chest cavity.

In March, 1925, the bronchial fistula had closed. The lung gradually expanded and filled the partially obliterated thoracic space.

On April 30, 1925, the parietal and visceral pleura were in apposition and there was no fluid present.

At a recent examination, October, 1925, there was no temperature or cough; her weight was about 121 pounds, and clinically she was well. This girl is as active as any normal individual and recently applied for training at the school for nurses at Pokegama.

DISCUSSION

Dr. E. K. Geer (St. Paul) (by invitation): If one looks over the literature on artificial pneumothorax he will find the incidence of pleural effusions in collapse cases varying from 40 to 100 per cent. Five to 15 per cent of these effusions become purulent, with only tubercle bacilli found in them. If he looks for the treatment of these purulent effusions he meets with disappointment because the treatment is mentioned in anything but optimistic tones. Aspiration is mentioned and usually that is all.

From my experience in a rather large series of pneumothorax cases, and I have treated about 110, I noted serous effusion in practically all, with 10 per cent becoming purulent. In attempting to clear up these tuberculous empyemata, I ran through the literature rather thoroughly and found aspiration advised as a palliative measure. By chance I ran across a statement of John B. Murphy that 2 per cent formalin in glycerin might clear up some of these stubborn empyemata.

Two of my tuberculous empyema cases cleared up by repeated aspirations; two others by formalin injections, and two by thoracoplasty. This girl, whose case has been presented to you, had a bronchial fistula for about a year without getting a pleural pyogenic infection. The whole thing responded so nicely to thoracoplasty that I think we will resort more frequently to thoracoplasty in similar cases. She did have a severe type of pulmonary tuberculosis when she came under our observation. The pulmonary lesion was controlled by injections of air. Then she developed a pleural tuberculosis which was more difficult to control. I think this is a very brilliant example of what thoracoplasty will do.

Dr. Daugherty: I think this problem of tuberculous empyema is a very great one and if we can save even a few of these patients with a thoracoplasty it is worth while.

Dr. W. P. Larson (Minneapolis) read a paper entitled "The Value of Surface Tension Depressants in Detoxifying Bacterial Toxins for Immunization."

DISCUSSION

Dr. F. W. Schlutz: The work and results of Dr. Larson are very impressive. It could easily come to pass that his results will have a revolutionary bearing upon the contagious disease problem. The manner in which he can make diphtheria and scarlet fever immunization practically safe and absolutely certain is truly remarkable. Few of us here now probably realize what far-reaching effects this may have. We have tried his methods in the University Hospital and in the out-patient department, and can entirely confirm the results presented here tonight.

I am firmly convinced that Dr. Larson's work represents a tremendous advance over the results obtained in Chicago and New York.

I would like to ask Dr. Larson whether there is any mechanism of accurately testing out or determining the point where the toxin has the maximal effect. It seems to me, from a technical standpoint, it would be a good thing to have some mechanism of standardization.

Dr. J. T. Christison: Dr. Larson has referred to the work done by my associate, Dr. Colby, and as I have had some part in this it may be of interest to you to know that we have about a thousand cases thus far. We began by using the material that the Doctors Dick gave us. The greatest objection to that was that the children had to have three injections. Then Dr. Larson announced that his soluble toxin would probably do away with the three injections and we began using that toxin. The results he has given you are unquestionably the results we are all getting from that type of material. There has been one case following the immunization treatment that was given to the children in the school Dr. Larson mentioned. Those children, theoretically, ought to have had a lot more scarlet fever; therefore, there must be some particular virtue in this type of immunization. In those instances where one child had scarlet fever and the rest of the family have been immunized, no other cases of scarlet fever have developed.

We have had only one case in which there was any apparent reaction and that was my own daughter, who is about 10 years old, and who gave a very positive reaction following a 4,000 skin test dose. There was no fever, and no discomfort, but she had a very apparent rash.

I am getting to the point where I say to the mothers that there is not now much excuse for people allowing their children to have scarlet fever or diphtheria. With the results we are geting, I think I am quite justified.

Dr. J. F. Hammond: I would like to ask Dr. Larson how dangerous it really is to use the old method of inoculating against diphtheria. People are asking us as to the advisability of having their children inoculated. What is the danger of anaphylaxis in future treatment?

Dr. A. Schwyzer: Our sincere thanks are due Dr. Larson for having brought this observation before the Academy. It seems to me, as I listened to this paper, that we have here a momentous finding; that we have something of enormous value. As the father of three children who not long ago had injections against diphtheria (the serum injection), I am quite impressed with the value of having an immunization that does not contain horse serum. When you hear that you could previously give 125 of certain units and now can give 3,000, the first question that comes to mind is, "Isn't it that this toxin undergoes a chemical change with the soap?" It seems, however, that the toxin is not changed, but the process, as Dr. Larson explained it, consists simply of putting a soap layer around the molecules. Thus the toxin is only very gradually freed in the course of time in the body and is, therefore, acting for a long while. Dr. Larson could even precipitate the soap and free the active principle and again have the toxin

action. I think it would be very interesting if Dr. Larson would tell us how he explains the action of the soap and what the factor of reduction of the surface tension is doing in the physical sense.

I think we have listened to something that is of the highest importance and value.

Dr. Burch: I am sure I express the sentiments of the Academy in thanking Dr. Larson for coming before us and giving us this very original and valuable work he is doing.

Dr. George E. Fahr (Minneapolis) read a paper entitled, "The Fatigue Factor in Cardiac Failure."

DISCUSSION

Dr. J. G. Cross: The term "heart failure" as often used as a cause of death is the "refuge of distressed diagnosticians," to quote from Osler's remark in another connection. However, in its true sense, as used by Dr. Fahr to describe the failing function of the mechanism of the heart to maintain circulation, it covers almost the entire field of heart disease, since such failure may come about as the result of valve, muscle, or nerve defect. Dr. Fahr has presented clearly the sequence of events which take place in the heart affected by myocardial trouble of a non-infectious character, as distinguished from inflammatory infections of the cardiac tissue. He states that heart failure is always the result of increase in the intracardiac (blood) pressure. This is not so far from the teaching of thirty years ago of "back pressure" and failure of one chamber after the other. At that time we were not so familiar with the toxic causes of muscle degeneration nor with the disturbances of conduction of the impulses. Undoubtedly, Dr. Fahr's meaning is that the increase in pressure is an event in the course of a failing heart, itself the result of a previous defect. The essayist, of course, did not pretend to enumerate all of the factors leading to heart failure or myocardial failure. That would be too large a task. He wisely chose to limit the discussion to the series of events leading up to the incompetent heart muscle.

It would be an error to believe that the problems concerned in heart failure are now entirely understood. We are still speculating on the cause of some heart phenomena, the recognition of which is not only difficult during life but not always cleared up at autopsy. It has been supposed for a generation that Prof. Welch's explanation of recurrent attacks of pulmonary edema, on the basis of a disproportion between the power of the right and left heart, was correct. This was propounded when he was a student with Conheim. Prof. Welch recently told me that this explanation did not account for many cases of such trouble, nor would it explain why so few patients with marked disease of one chamber of the heart escape attacks of lung edema. This is another instance of the abandonment of the old "backing up" idea.

We are indebted to Dr. Fahr for his sharp distinction between infectious myocardial troubles and toxic muscle defects which are purely physical and toxic.

Dr. J. F. Hammond: Dr. Fahr spoke of the length of time it took for the increase in the size of the heart in hypertrophy. I would like to ask Dr. Fahr if, in the progress of a case when it is recovering clinically, he can see any appreciable decrease and how much in the size of the heart. One heart was recently reported to have been 3 inches too large and after ten days' treatment it was 2 inches smaller. I would like to ask him also how long, during treatment, he thinks it is well for these patients to stay in bed and if it is good for them to have absolute rest or some exercise if they have vague heart symptoms such as pains, etc.

Dr. J. S. Gilfillan: I agree with Dr. Fahr on almost everything he said, especially on leaving the teeth in. Why the failure of these hearts takes place at a certain time, one cannot always tell. I think that the name myocarditis is used a great deal now just from force of habit and that a great many people who use it do not mean myocarditis, or they do not mean by that that there is an inflammatory condition in the heart muscle. We use it now as a joke. But that is one reason for the persistence of the term. I think Dr. Fahr is right on the importance of rest in these cases. That really is the great thing for them. If I had to do without either digitalis or morphin I would rather do without the digitalis in many cases, as they can't get rest without morphin. Both are important, of course, but one is of greater importance than the other.

Dr. E. L. Gardner: I agree absolutely with Dr. Fahr. We might discuss the relation of focal infection or any other toxemia, affecting the body as a whole, which indirectly produces a premature breakdown of cardiac compensation. I think that it is only in an indirect way that focal infection has any relation to cardiac failure. I know of no evidence which can be obtained from a pathological examination of the heart which indicates inflammatory changes—a true myocarditis; on the other hand it is not safe to assume that focal infection or other toxemias do not impair myocardial function just because we cannot demonstrate structural damage under the microscope; clinical evidence, unreliable as it may often be, is to the contrary.

I agree with Dr. Gilfillan that much of the argument arises from the use of a faulty terminology. The term "myocarditis" should be reserved for conditions due to true inflammatory changes in the myocardium and not applied to all myocardial weakness regardless of cause and positive demonstrable structural damage. The clinician has carelessly used the term to include any myocardial failure; such terms as "cardiac sclerosis," "toxic myocardium," "weak myocardium," etc., should be used, remembering all the time that the heart alone is not singled out, but is a symptom of a general body dysfunction. In such a sense I believe we would all agree to remove any toxic or nutritional cause affecting the body, including the myocardium. It is, therefore, very important to maintain the patient's good health to prevent cardio-circulatory breakdown, especially where there has been some former mechanical damage such as myocarditis, valvular disease, or pericardial adhesions.

Upon motion the meeting adjourned.

John E. Hynes, M.D.,
Secretary.

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

TWO INSTANCES OF PERFORATION OF THE HEART FOLLOWING NON-PERFORATING CHEST INJURY*

E. L. Tuohy, M.D., and G. Berdez, M.D.
Duluth, Minn.

Case 1.—E. E. Aged eleven years. Came to coroner's autopsy at Duluth, Minn., June 10, 1925.

The following clinical data were elicited by the intern at St. Mary's Hospital, Dr. Bakkila. The pathological notes and findings were made by Dr. G. Berdez, pathologist at St. Mary's Hospital.

Clinical Data: The child had been struck by an auto a few minutes before being brought to the hospital.

On entrance he was unconscious, the skin cold and clammy, and in very obvious shock. There was a restlessness, exhibited by constant movement of the arms and head. The pulse was found very rapid—the heart tones scarcely audible. Normal reflexes looked for were present, and no abnormal reflexes were found. There was no external injury whatever, except a slight abrasion near one ankle, and over one side of the face. Two hours later the pulse had slowed down somewhat, but was still imperceptible, and the heart tones were distant and obscure. Involuntary bowel movements occurred. He died about three hours after entering the hospital.

It was stated on the record that death occurred about four hours after the accident.

Autopsy Data: The only external injuries noted on careful examination of the body were slight abrasions on the face, neck, the upper right arm, and near the ankles.

On opening the chest the pericardial cavity was found distended with fluid blood. The parietal pericardium was found intact. Marked ecchymosis was found under the visceral serosa, near the apex of the heart, and a small perforation was found at the apex, just admitting a moderate sized match into the cavity of the left ventricle. There was no abnormality whatever noted in the heart otherwise, either as to the valves or the heart muscle. A small amount of bloody fluid was found in the left pleural cavity, and there was evidence of some subserous interlobular hemorrhage.

Case 2.—R. A. C. Aged 63 years. Came to coroner's autopsy at Duluth, Minn., Oct. 5, 1925.

The following notes were elicited and assembled by Dr. G. Berdez, pathologist at St. Mary's Hospital, Duluth.

Clinical Data: Unfortunately, there had been no doctor's examination whatever. However, the man's son, and other members of his family, recite the following: Two weeks prior to his death he suffered an injury in his automobile, in which he was thrown, with a good deal of force, against the steering wheel. From that time on he did not feel well. His symptoms were chiefly those of pain and distress in his chest, a feeling of fullness and discomfort in the upper abdomen, and he is said to have vomited nearly every day. It is apparent, nevertheless, that he went on about his way, and, so far as is known, did not consult a physician. There was no external precordial injury or abrasion.

He died suddenly while sitting in his seat in a movie theatre—attending a performance of "The Freshman" (with Harold Lloyd!).

Pathological Data: There was a rupture, about one inch long, through the wall of the left ventricle, the pericardium was full of blood, some of it partially clotted.

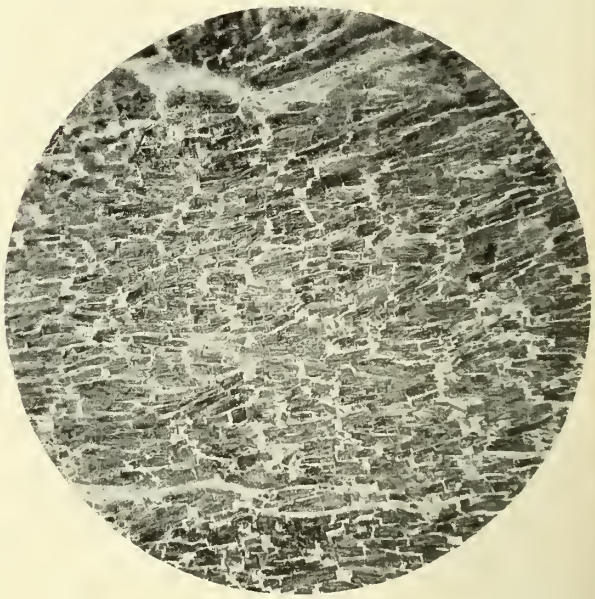


Fig. 1

A careful examination, however, of the site of the rupture, indicated clearly previous evidence of trauma, some tearing, and evidence of muscle fibre fragmentation, recent scar formation, and moderate hemorrhage. These features, tending to establish this local injury (probably when he was thrown against the steering wheel of his car), may be briefly summarized as follows:

1. The site of the rupture was described by the pathologist as "like a repair wound in the second week."

2. There was evidence of small old hemorrhage into the pericardium and into the fragmented muscle bundle. Red blood cells could be seen in the granulation tissue still showing their form and hazy outline. There were a few pigment granules. (Hemosiderin forms within about seven days after hemorrhage into the tissue.)

3. The recent granulation tissue itself was sharply limited and circumscribed to the area of the ultimate rupture.

*From the Pathological Laboratory and the Clinical Records, St. Mary's Hospital, Duluth, Minnesota.

*Hirshfelder: "Diseases of the Heart and Aorta." Lippincott, 1918.

4. The marked fragmentation of the fibres of the myocardium was found nowhere else, on careful study of the heart.

It may be stated that he had very marked arteriosclerosis, and the left coronary artery somewhat narrowed, the right not to such a degree. The base of the aorta showed very advanced atheroma.

Comment: In contrast to the young boy of 11 years, the factors of senility, general atherosclerosis and interference with the nutrition of the heart enter, and tend to complicate the clinical sequences. The evidence of injury to the site of ultimate rupture of the ventricle wall, coming on two weeks previously, is quite conclusive. Would this have happened if the heart muscle had been normal? It is well known, of course, that rupture of the heart not uncommonly follows partial or total coronary occlusion.

The events following upon coronary blockage and infarction, with anemic necrosis and myomalacia cordis, are well known. However, the picture here was totally different, and for that reason carries great interest.

To further elucidate the structural changes in the man 63 years old, three photomicrographs are hereby presented. Figure 1 shows the field under lower power, illustrating the nearby and regional "fragmentation." Figure 2 shows the low power within the area itself of "recent scar formation and moderate hemorrhage." Figure 3 is a higher magnification in portions of the same area, showing the adjacent muscle fibres and with them the newly forming connective tissue cells.

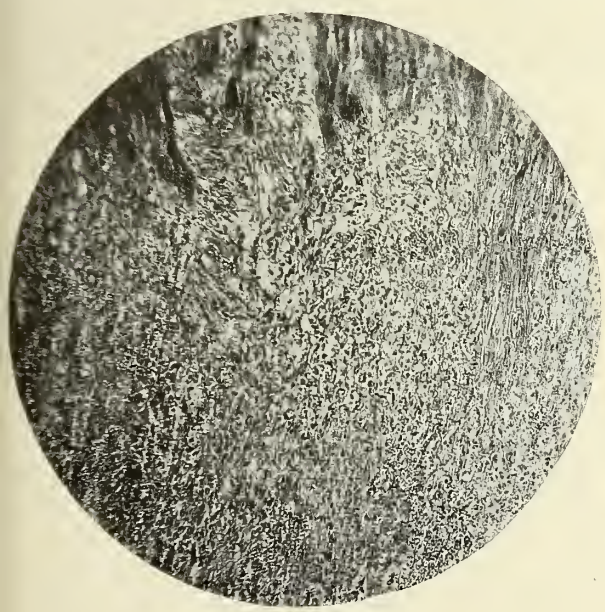


Fig. 2



Fig. 3

Literature: Hirshfelder* has the best succinct data and references upon "non-perforating injuries" of the heart that have come to our attention in the English literature available.

Blancard, in 1688, recorded the first instance in a forty-five-year-old man who had been run over by a heavy cart.

Bernstein, in 1896, collected from the literature 126 cases. Forty-two of these had come to autopsy, and a list of the lesions found were catalogued.

G. Fisher (reference in Hirshfelder's book) gave a list of the sources of trauma resulting in cardiac rupture without external injury. In this list, falls from various heights and injuries from heavy carts or wagons comprised by far the largest number.

One of us (Dr. Berdez), in a casual review of the German literature, has uncovered the following references:

Dr. C. Thiem, "Handbuch der Unfallheilkunde," Second Edition, 1910, Vol. II, Part 2, p. 237, considers this subject both in instances where fatty change and brown atrophy had preceded traumatic rupture, and also in others, where the heart had up to the time of the accident been in good condition. A definite case of the latter is mentioned where autopsy showed a rupture in the ventricle and a tear 4 cm. long in the interventricular septum. This followed a kick from a shod horse. He refers also to the cases mentioned by Fisher, and mentions an athlete, 25 years old, who died one and one-half hours after a severe blow in the region of the stomach. The autopsy showed a tear in the wall of the right ventricle, 11 cm. long. The ventricle wall microscopically showed only some fatty change.

Von Bergman instances an extensive tearing of the heart, without any external injury to the thorax, in a young man injured between two railway cars.

Kugel, "Ein fall von Herzruptur." Praeger med. Wochenschrift, 1909-21: This interesting case (a 44-year-old man) was injured while loading large, heavy bales. One fell back upon him, injuring him, obviously internally. After treatment and stimulants he recovered, but the following day felt badly and was much agitated, and had severe pain

in the region of the liver. He died forty-two hours after the beginning of this pain. Autopsy showed a rupture of the right auricle.

Greig, "A Case of Rupture of the Left Auricle of the Heart," Lancet, October 31, 1908. In this instance, after great over-exertion, a 24-year-old patient collapsed. Despite the youth of this patient and the presumptive reasonable integrity of the heart, autopsy showed a rupture of the left auricle.

Ebbinghaus, "Betrag zur Lehre von den traumatischen Erkrankungen des Herzens. Ein fall von subcutaner traumatischer Herzruptur mid tod am 9 ten Tage." Deutsche Zeitschrift für Chirurgie, 1903, Bd. 56, instances a case in which the histological findings were very similar to the findings in our second case.

PRIMARY PNEUMOCOCCIC PERITONITIS IN CHILDREN: REPORT OF CASE

HARRY OERTING, M.D.
St. Paul

Primary pneumococcic peritonitis is one of the most serious abdominal conditions we have to deal with in children and has a mortality of almost 100 per cent. Strictly speaking, the condition is not entirely one of childhood, but the incidence is so much greater in children than it can be considered primarily a disease of childhood.

McCartney and Frazier, of Edinburgh, believe that primary pneumococcic peritonitis is a disease peculiar to the female sex and contend that the infection enters through the genitals. Of the fifty-six cases reported by them no primary case was seen in the male. However, authentic cases of primary pneumococcus peritonitis in the male have been reported and the infection in these cases must have been by the blood stream or the gastrointestinal tract. Pneumococcic peritonitis is a rare complication of pneumonia and is then considered a secondary pneumococcic peritonitis and will not be considered here.

There are two recognized types of primary pneumococcic peritonitis—the localized and generalized—and the clinical picture differs according to type. The localized or circumscribed form has an acute onset with pain over the abdomen, fever, profuse vomiting and severe diarrhea. The symptoms gradually improve and in a week or ten days the process becomes encysted with abscess formation. If not relieved surgically the localized abscess usually ruptures at the umbilicus. Rarely it may rupture into the bladder, intestine or vagina. The diffuse form is ushered in with high fever, intense abdominal pain, delirium, prostration, persistent vomiting and profuse diarrhea with or without blood. The abdomen usually shows distension and some rigidity.

These cases are usually diagnosed acute perforating appendicitis with general peritonitis. However, the history of onset and subsequent events should place us on our guard and especially when the examination shows a patient prostrated beyond all reason considering the amount of abdominal distension and rigidity. The history of acute onset followed by vomiting and diarrhea is not characteristic of appendicitis with acute peritonitis.

The consensus of opinion as regards treatment is diagnosis at the earliest possible moment with immediate operation and adequate drainage.

Case Report.—E. G., a girl, aged 5, was admitted to St. Luke's Hospital on Dec. 3, 1925. The mother, father, brother, sister and herself had just recovered from an epidemic cold with fever, sore throat and cough of two weeks' duration. The afternoon of December 2 the child complained of pain in the lower abdominal region. She was seen by her physician and in the absence of definite physical findings it was considered a slight stomach upset from the cold she had been having. During the night she was very restless and at 4 A. M. became acutely ill with a severe pain over the entire abdomen but more especially in the lower quadrants. The child vomited several times and began to have a diarrhea. At 6 A. M. she was seen by the family physician, who diagnosed a general peritonitis and sent her to the hospital by automobile, a distance of about 15 miles. When seen at the hospital at 8 A. M. the abdomen was moderately distended, there was some rigidity over the entire abdomen, marked tenderness, and the child cried out when touchd. The temperature was 105.2, respiration 25, pulse 140, lungs clear, heart normal. Catheterized specimen of urine: sp. gr. 1,020, slight trace of albumen, sugar negative, sediment negative, acetone one plus on a basis of four, wbc 35,000 with 92 per cent polymorphonuclear cells.

A diagnosis of general peritonitis probably secondary to a ruptured appendix or a ruptured Meckel's diverticulum was made and immediate operation advised and accepted.

Operation: Under ether anesthesia the abdomen was opened by Dr. Ritchie along the right rectus border. When the peritoneum was opened there was a discharge of slightly yellowish flaky pus without any odor. The intestines were all inflamed and there was considerable fibrin present. The appendix was red and covered with fibrin at the tip and it was removed. No Meckel's diverticulum present. A diagnosis of pneumococcus peritonitis was made, cultures were taken and thorough drainage was provided for and the abdomen closed.

Laboratory findings: Cultures of the pus from the abdomen showed a pure strain of pneumococcus.

Subsequent course: Following the operation the temperature dropped to 103.4 and remained at this level and the child looked better for several days. Water was given by rectum and sparingly by mouth. Death occurred on Dec. 8, six days after onset.

STREPTOCOCCUS VACCINE AND MIXED STAPHYLOCOCCUS-ACNE VACCINE OMITTED FROM N. N. R.

The Council on Pharmacy and Chemistry announces that all streptococcus vaccines and all vaccine mixtures containing staphylococci and acne bacilli have been omitted from New and Non-official Remedies because experience with these preparations has not established the value which it was hoped they possessed and because recognized experts to whom the Council looks for help have concluded that these preparations have no field of usefulness. (Jour. A. M. A., Jan. 23, 1926, p. 294.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

PEDIATRICS

SUPERVISORS:
CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS
ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

EXPERIMENTAL STUDIES ON RICKETS: Andor de Bosanyi, M.D. (Amer. Jour. of Diseases of Children, December, 1925). The formation of normal bone is closely connected with a normal organic function of the bone marrow, and the disorders of calcification and ossification in rickets is closely connected with, or due to, pathologic changes in bone marrow function.

Bone is to be regarded as a physiologic unit—an organic system consisting of several kinds of tissues—and the growth of bone, that is, the formation of new bone, is dependent on an interaction of the functions of all these tissues.

Evidence has been obtained that the antirachitic factor in the healthy bone marrow of rats is a water-soluble protein.

Hemoglobin has a marked antirachitic effect when given in certain definite amounts. No rickets developed in rats which were put on diet No. 3143 containing 10 per cent of hemoglobin when they were 40 or 50 gm. in weight.

It seems logical to hypothecate a possible relationship between the globin of hemoglobin and the specific antirachitic protein produced by the bone marrow.

Certain proteins, presumably histons, with a high content of arginin, play an important rôle in the process of normal ossification. These substances are produced in the bone marrow.

Certain amins and physiologically similar alkaloids induce the healing of rickets presumably by stimulating the bone marrow.

Hemoglobin induces the healing of rickets not only in rats but also in children.

The primary event in the healing of the rickety process in the bone is its calcification due to local alterations in the rickety tissue. The changes in the chemical constitution of the blood serum, especially as regards the inorganic phosphorus, though they follow calcification of the bone very rapidly, are of a secondary nature and are sequelæ of the calcification.

R. N. Andrews, M.D.

THE CARBOHYDRATE METABOLISM OF THE MARANTIC INFANT: Frederick F. Tisdall, M.D., T. G. H. Drake, M.B., and Alan Brown, M.D. (Amer. Jour. of Diseases of Children, December, 1925). It is well recognized clinically, that of the three organic constituents of the food, namely, fat, carbohydrate and protein, the fat is more apt to cause digestive disturbances in marantic infants than either of the other two.

Hutchison, and Fleming and Hutchison, after extensive investigations and a critical review of the literature, came to the conclusion that "there is no defect in the power of atrophic infants to absorb fat."

In regard to protein absorption, Courtney, Utheim, Fleming and Hutchison and others have found no evidence of any defects in the ability of marantic infants to digest and absorb this constituent of the food. It is much more difficult to answer definitely as to the ability of the marantic infant to digest and absorb carbohydrate.

On account of the frequency with which marantic infants develop gastro-intestinal disturbances, Fleming believes that "failure of the gastro-intestinal tract to deal with carbohydrates satisfactorily is an important factor in the production (and maintenance) of atrophy."

In regard to the sugar tolerance curve obtained after the ingestion of glucose, Brown found that "the curve is identical in the normal and undernourished child." This would indicate that there is no defect in the ability of marantic infants to absorb carbohydrate.

There is no evidence that the marantic infant is not able to digest and absorb carbohydrate in a normal manner, provided no diarrhea is present. On the other hand, there is considerable indirect evidence that the marantic infant does digest and does absorb carbohydrate as readily as the normal infant.

It is quite apparent from a review of the literature and from the authors' figures that the concentration of the fasting blood sugar is lower in marantic infants than in normal infants.

The heat output per kilogram of active metabolic tissue is approximately the same with the marantic infant as with the normal infant.

It is evident that, calculated on the basis of the active metabolic tissue, the capacity of these marantic infants to utilize injected glucose is approximately the same as for the normal infant.

This consideration of the carbohydrate metabolism of marantic infants indicates that there is no derangement in the digestion and absorption of carbohydrate, and that glucose after it reaches the blood stream is removed at approximately the normal rate.

The author concludes, therefore, from the evidence available that the marantic infant absorbs and metabolizes carbohydrate in a normal manner, with the exception that it has not the stabilizing influence on the fasting blood sugar level of an adequate reserve of glycogen.

When feeding the marantic infant, it should be remembered that on the basis of the mass of active protoplasmic tissue, 70 calories per pound per day for the marantic infant is the exact equivalent of 45 calories per pound per day for the normal infant.

R. N. Andrews, M.D.

HYDROCEPHALUS: McKinn Marriott (Med. Clin. N. America, 9-45, July, 1925). In handling a case of hydrocephalus the first step is to determine whether or not the hydrocephalus is the result of an active meningitis or if it is due to obstruction between the ventricles and subarachnoid spaces. Information regarding the first point can be obtained from an examination of the cerebrospinal fluid. The fluid obtained by lumbar puncture may be clear, whereas that obtained from the ventricles may contain an excess of cells or may even be definitely purulent. Both ventricular and lumbar puncture should usually be done. This is easily accomplished in the case of infants. Information as to the communication between the ventricles and the subarachnoid spaces is obtained by observing whether or not there is a free flow of fluid on lumbar puncture, and if the fluids in the ventricles and in the subarachnoid spaces are under the same degree of pressure; further, whether pressure on the fontanel causes a distinct increase in the flow of fluid from the lumbar puncture needle.

In the case of active meningitis due to the meningococcus appropriate serum treatment should be instituted, and it is well to note in this connection that in the case of infants with meningococcus meningitis it is advantageous to administer serum into the ventricles as well as into the spinal subarachnoid space. In syphilitic meningitis appropriate antisiphilitic treatment should be instituted. In the so-called "acute hydrocephalus" of tuberculous meningitis treatment is at best palliative and should consist in frequent lumbar punctures.

When hydrocephalus is of the "communicating type," *i.e.*, when there is free communication between the ventricles and the subarachnoid, diuretin should be administered, and usually this treatment leads to good results. When hydrocephalus is of the non-communicative type surgical procedures are indicated.

C. A. Stewart, M.D.

BLOOD PLATELET COUNTS IN INFANTS AND IN YOUNG CHILDREN: John P. Caffey, M.D., and Stafford McLean, M.D. (Amer. Jour. of Diseases of Children, December, 1925). Dyke states that there can be no doubt that the platelets are entities, and that the proof is now complete of their relationship to the hemorrhagic diathesis and to the production of purpura. Duke has shown that when the platelet count falls below 60,000 per cubic millimeter there is an abnormal tendency to bleed; that when it falls below 10,000 hemorrhage becomes severe and when below 1,000, fulminant. Two main factors concerned in the production of hemorrhage are: (1) toxic action on the endothelium of the vessels, and (2) removal of the platelets from the circulation.

Lucas and Fleischner in Abt's "Pediatrics" give the normal for children as 250,000, with variations from 200,000 to 400,000. There is no relationship between the number of red cells or white cells and the platelets. It is notable that the number of platelets in the newborn and the premature infants averaged 278,000 and 246,000 as contrasted with an average of 359,000 and 346,000 in the two older groups of infancy and of early childhood.

A comparison of the hemoglobin percentage with the number of platelets reveals no parallelism, which is also true in a comparison of the red cells with the platelets.

Syphilis may produce a reduction of platelets, perhaps, by a depressed activity of the megakaryocytes due to the action of a syphilitic toxin on these cells, or, perhaps, by an active spirochetosis of the bone marrow.

In fourteen cases of severe anemia in children less than 22 months of age, the average platelet count was 266,000. In these cases, a severe anemia was not accompanied by an abnormal platelet count except in three instances when it was definitely diminished.

In four cases of splenectomy, there was a slight increase in the number of platelets during a long period of observation following the operation.

In three cases of acute lymphatic leukemia, there was a marked reduction in the number of platelets.

Diseases of the Respiratory System.—In ten cases of acute bronchitis. In sixty-nine cases of pneumonia. In sixteen cases of acute suppurative pleurisy.

In four patients with pneumothorax, three of whom had suppurative pleurisy. In six cases of tuberculosis.

In five cases of active infantile scurvy.

In fifteen cases of meningitis. In eight cases of other inflammatory diseases of the central nervous system.

In forty-four cases with various types of acute infection.

In five of seven cases of congenital syphilis.

In twenty-four cases of acute intestinal indigestion, acute intestinal intoxication and acute catarrhal colitis, the platelet counts were all normal.

R. N. Andrews, M.D.

TREATMENT OF PNEUMONIA IN CHILDREN WITH MERCUROCHROME INTRAVENOUSLY: Lewis D. Hoppe and Wm. T. Freeman, M.D. (Jour. of Southern Medical Journal, November, 1925). A full grown rabbit was given 5 mg. of mercurochrome per kilo of body weight intravenously — another rabbit of the same weight was used for control. One hour later both animals were killed and the lungs removed under aseptic precautions. The fluid was expressed from the lungs of both rabbits and collected in separate sterile containers. The separate fluids were inoculated with various strains of organisms and allowed to stand 15 minutes and one hour respectively. The results of these experiments show that following the intravenous or intraperitoneal injection of mercurochrome, the fluids squeezed from the lungs are inhibitory to the growth of bacteria. A sufficient quantity of mercurochrome to make a 1 per cent solution is dissolved in distilled water and filtered. Only freshly prepared solutions should be used and they should not be boiled. The usual dose was 5 mg. per kilo of body weight. A 1 per cent solution is not irritating to the peritoneum and may be safely given. Two to three doses may be repeated in 24-hour intervals.

In the twenty-three control cases the average duration of illness was 16.5 days; while in those receiving mercurochrome the duration of illness was 6.5 days. The twenty-three cases treated with mercurochrome were sick an average of 2.25 days after the first dose was given. The mortality of the control group was 39 per cent, while in those treated with mercurochrome the mortality was 8.5 per cent.

R. N. Andrews, M.D.

GYNECOLOGY AND OBSTETRICS

SUPERVISORS:
ARCHIBALD L. McDONALD,
FIDELITY BLDG., DULUTH
L. W. BARRY,
LOWRY BLDG., ST. PAUL

CHRONIC PELVIC INFECTIONS: Arthur H. Curtis (Surg., Gyn. & Obstetrics, January, 1926, Vol. XLII, No. 1). The author presents certain deductions drawn from combined clinical and laboratory experience.

1. Concerning Chronic Leucorrhea: This arises chiefly from the cervix and from glandular pockets about the urethra. It has also been found that thirty per cent of the patients with chronic purulent leucorrhea are carriers of virulent streptococci. This means that about one in three women with chronic discharge is liable to spontaneous postpartum infection, especially if there have been lacerations of the cervix. Also vaginal operations on such patients are accompanied by more than the usual risk of infection.

2. The Endometrium: Microscopic and bacteriologic studies indicate that chronic infection of the endometrium is quite unusual. Supra-vaginal removal of the chronically diseased uterus is a clean procedure, and treatment of the stump with iodine or cautery is ordinarily superfluous. Similar studies of the endometrium from uteri removed a few days following curettage or packing, proved that many of these showed bacteriologic and histologic evidence of infection. Extensive intra-uterine instrumentation introduces the possibility of a temporary acute endometritis. This is supported by clinical experience, after hysterectomy in these cases and after criminal abortion. Here it is found that the clean uterus may be entered with impunity, but a second invasion stirs up the bacteria previously introduced and results in active infection. High morbidity or mortality after abortion is almost pathognomonic of repeated invasion of the uterus or accidental perforation.

3. The Fallopian Tubes: The gonococcus attacks the tube from within, while the streptococcus infection of the tube is only a part of widespread pelvic infection.

4. a. Gonorrheal Infections: Microscopic and bacteriologic studies of the tubes indicate that the tissues are usually sterile two weeks after fever and leucocytosis has subsided. It is considered that recurrence of salpingitis is really reinfection rather than chronic local infection. This may represent a new infection from without or ascending infection from traumatism of a chronically infected cervix.

b. Streptococcus Infection: Similar studies indicate that the bacteria persist in the tissues for a much longer period (six months to two years). Surgery is done only for complications or sequelæ and should be postponed for at least six months to allow the infection to subside. A more radical attitude is taken towards the ovaries because there is considerable danger of reinfection.

Conclusions: 1. Operation by the vaginal route upon patients with chronic purulent leucorrhea introduces an increased risk of post-operative streptococcic pelvic peritonitis. 2. The endometrium of the body of the uterus is nearly always free from bacteria. Supravaginal hysterectomy is, therefore, ordinarily a clean procedure. 3. Mild infection of the endometrium is relatively frequent after diagnostic curettage. Hysterectomy should preferably be performed at the time of the curettage or postponed until the subsidence of the inflammatory reaction. 4. Operations upon Fallopian tubes for eradication of gonorrheal infection are not often indicated, because the infection tends to disappear if the patient is protected from reinfection. Surgery should be delayed and reserved chiefly for sequelæ, such as adhesions, menstrual disturbance, and sterility.

A. L. McDonald, M.D.

THE BELL-BEUTTNER OPERATION WITH OVARIAN CONSERVATION OR GRAFTING: W. Blair Bell (Surg., Gyn. & Obstetrics, Jan., 1926, Vol. XLII, No. 1). The author discusses the more essential points concerning the indications and technic of this operation. He particularly emphasizes the importance of a proper selection of cases. The Bell-Beuttner operation is particularly indicated for those inflammatory lesions which cause irreparable damage to the Fallopian tubes, possibly to the ovaries, and affect the fundus of the uterus, but less severely. This is most often the gonococcus infection and it must have reached the chronic stage before being treated surgically. It is usually advisable to amputate or treat the cervix uteri, especially when there are lacerations.

Lesions of the fundus uteri due to infection cause menorrhagia. The other symptoms are those of chronic salpingitis, ill-health, abdominal pain, dysmenorrhea, etc. In the absence of menorrhagia the fundus is rarely involved, and simple salpingectomy including the interstitial portion is sufficient. In more severe cases, or in those approaching the menopause, hysterectomy with removal of the adnexa is advisable. The operation in question then is reserved for a limited group of cases with irreparable lesions of the tubes and ovaries and definite infection of the fundus uteri. The author does not leave the ovary in the pelvis if there is any question concerning its blood supply. If the woman is under forty years of age ovarian graft is advised if both ovaries have been removed from their normal connections. The technic of the operation is described in detail and is well illustrated. The ligaments are ligated before being divided, so the operation is practically bloodless. If one ovary is to be conserved the corresponding tube is removed, leaving the meso-salpinx and ligating the bleeding vessels subsequently. On the anterior surface of the uterus a flap of peritoneum with the bladder is reflected, and, after closing the uterus and controlling bleeding, this flap is sutured over on the posterior surface covering the pedicles and all raw surface.

A. L. McDonald, M.D.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

EARS AND THE MAN: STUDIES IN SOCIAL WORK FOR THE DEAFENED. Annetta W. Peck, Estelle E. Samuelson and Ann Lehmann, New York League for the Hard of Hearing. Introduction by Wendell C. Phillips, M.D. 217 pages. Cloth, $2.00. Philadelphia: F. A. Davis Company, 1926.

THE PRINCIPLES AND PRACTICE OF ENDOCRINE MEDICINE. William Nathaniel Berkeley, Ph.D., M.D. 368 pages. Cloth, $4.50. Illus. Philadelphia and New York: Lea and Febiger, 1926.

MODERN MEDICINE. Its Theory and Practice. Edited by Sir William Osler, Bart., M.D., F.R.S. Third Edition, re-edited by Thomas McCrae, M.D., assisted by Elmer H. Funk, M.D. Vol. II. 891 pages. Illus. Cloth, $9.00. Philadelphia and New York: Lea and Febiger, 1925.

PSYCHOLOGICAL HEALING. Pierre Janet. Translated from the French by Eden and Cedar Paul. Vols. 1 and 2. 1,265 pages. New York: MacMillan Company, 1925.

SUBMUCOUS ENDOCAPSULAR TONSIL ENUCLEATIONS. Clinics of Charles C. Miller, M.D. 218 pages. Illus. Chicago: Oak Press, 1925.

A brief description of the details of this operation is as follows:

Crypts of tonsils are thoroughly sterilized, after which injections of novocaine are made into the substance of the tonsil itself, but not into the peritonsillar region. With a sharp knife an incision is made into but not beyond mucous membrane, vertically, bisecting the tonsil surface. The mucous membrane is then dissected away from tonsil both backward and forward, leaving two membrane flaps, which are left as a protective barrier. The tonsil mass is then grasped and dissected out by means of a punch, being careful not to include basal membrane or capsule. Any small remnants are easily seen and eliminated by use of the punch. Lymphoid masses at base of tongue are removed by curved tonsil scissors or any angular punch.

Some of the advantages of this technic for tonsillectomy are given as follows: (1) the base membrane and peritonsillar connective tissue are left as a protective against infection. (2) Trauma or exposure of pharyngeal musculature is avoided. (3) The pericapsular blood vessels are not divided, eliminating ligation or other hemostatic measures because of cutting the larger blood vessels. (4) Avoids cicatrization and resulting sore throat and lowered resistance. (5) Prevents atrophy of pillars. (6) Prevents change in singing or speaking voice by perfect use of soft palate.

This book describes in detail the treatment of peritonsillar abscess, also the complications of infection in the tonsils. It is well written and illustrated. There are several objections to both the author's reasoning and technic which will readily come to mind on its reading, and the book is recommended for an evening's perusal as a radical departure from well established channels of procedure.

K. C. WOLD, M.D.

WANTED—Salaried appointments for Class A physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

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POSITION WANTED—Laboratory technician, young woman, three years New York hospital experience. Can do blood chemistry, chemical pathology and bacteriology or assist otherwise in doctor's office. Write Miss E. Waxman, 5105 Colfax Avenue South, Minneapolis, Minn.

FOR SALE—Wappler E-Xell diathermy and large rotary converter, used four months. Reason for selling, formed partnership duplicating this machine. Can buy one or both. Address C-71, care MINNESOTA MEDICINE.

WANTED—Well qualified eye, ear, nose and throat man, good refractionist and operator, wants assistantship or location. Gentile, Protestant, excellent references. Address C-68, care MINNESOTA MEDICINE.

WANTED—Physician who wants to associate himself with dentist. Fine location, new building, Minneapolis. No other physician on the avenue. Telephone Hy. 0262. After office hours, Col. 4247.

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LOCUM TENENS—Prefer a man who has just completed internship April 15 to July 10. Address C-76, care MINNESOTA MEDICINE.

MINNESOTA MEDICINE

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URINARY ANTISEPSIS — THE CLINICAL APPLICATION OF EXPERIMENTAL DATA*

EDWIN DAVIS, M.D.
Omaha

Each of us is daily confronted with the problem of urinary antisepsis. This statement applies particularly to those of us doing urological work exclusively, but includes also each and every one engaged in general practice. Cases of urinary infection, characterized chiefly by frequent and painful urination, and by the presence of pus or bacteria, or both, in the freshly voided urine, are observed very frequently, in either sex, at any age. Those instances of urinary infection not frankly traumatic in origin, or due to faulty instrumentation, we are accustomed to explain on an hematogenous basis by reason of an associated extra-urinary focal infection or an acute infectious disease. We have been able to establish a fairly definite relationship between urinary infections and certain predisposing or accessory causes, chief among which are imperfect urinary drainage, stone, tumor, foreign body and trauma. Our knowledge, however, as to the exact etiology and mechanism of urinary infections remains rather meager. And when we come to a consideration of the treatment of these infections, we encounter a problem even more baffling. At the present time there is no known drug which may be given by mouth and which may be depended upon to prevent the growth and development of bacteria within the urinary tract. Yet there is reason to hope that such a drug may be discovered or synthesized. In fact, laboratory evidence accumulated during the past few years goes to show that there are at least three chemical compounds, each of which comes very close to fulfilling the requirements essential to the ideal internal urinary antiseptic.

*From the Department of Urology, University of Nebraska College of Medicine. Read before the Southern Minnesota Medical Association, Owatonna, Minn., May, 1925.

In the early experimental work upon this subject,[1] the ideal internal urinary antiseptic was defined as a chemically stable compound, comparatively non-toxic, and non-irritating to the lower urinary tract, which is eliminated, unchanged, by the kidney, and which exerts a definite antiseptic action in high dilution in urine of any reaction. The three compounds meeting these experimental requirements are chlor-mercury fluorescein,[2] acriflavine[3] and hexyl resorcinol.[4] There is laboratory evidence to the effect that either of these compounds administered to a normal individual will cause the secretion of urine which will kill the colon bacillus in a test tube. There is further evidence indicating that mercurochrome,[5] although eliminated by the kidney in relatively small percentage as compared with the other three, will also cause the secretion of antiseptic urine by the normal individual. Yet the clinical fitness of each of these four drugs awaits conclusive demonstration. In other words, there is a distinction between the fulfillment of ideal experimental requirements and practical clinical application. This is a disappointment, but a fact. For example, the urine of a normal individual, obtained following the administration of one of the above compounds, placed in a test-tube and inoculated with colon bacilli or staphylococci, will become sterile during incubation. Yet the same dose of the same drug, administered at frequent intervals over a period of weeks to an individual with chronic bacteriuria, is likely to have no appreciable effect upon the number of bacteria in the freshly voided urine, or upon the clinical symptoms. This indicates clearly that the test-tube experiment is not exactly duplicated within the living human urinary tract. As will be outlined below, there are other factors which enter in. We must therefore further modify our definition of the ideal internal urinary antiseptic. We must distinguish between the *experimental* and the *clinical* internal urinary antiseptic, and define the latter as that drug which not only possesses the above-listed theoretical requirements, but which also is of *distinct, proven clinical value.*

To attempt to conclusively prove the clinical value of a given "experimental" urinary antiseptic is to enter into a problem of far greater complexity than the original laboratory investigation proving the antiseptic properties and the "renal affinity" of that same drug. The treatment of each patient is an individual clinical experiment, which is necessarily lacking in the "control" which we are able to apply to laboratory experiments. Among the many confusing variable factors which enter into each clinical trial, probably the chief cause for inaccuracy in interpretation of results is the spontaneous or unexplained day-to-day variation, which is frequently observed in the pus and bacterial content of the urine of a given individual. That urine which is cloudy and infected to-day may be clear and sparkling to-morrow, for no known reason. Coincident with these variations in the urine we are accustomed to see alternating periods of exacerbation and spontaneous improvement in the clinical symptoms. In these cases there is therefore every opportunity for the *post hoc, ergo propter hoc* fallacy to enter in.

Inaccuracies in interpretation of clinical results also creep in through the improper selection of cases, and through failure to eliminate, by thorough investigation, the so-called accessory or predisposing causes of urinary infection. That a given case of uninvestigated pyuria or bacteriuria should either improve or fail to improve, following the administration of a given drug, is not evidence of particular value either for or against the efficiency of that drug. Numerous so-called accessory or predisposing causes of urinary infection must first be eliminated. There are certain well-defined and well recognized, "intra-urinary," predisposing factors, which may be grouped under the main headings, urinary retention, calculus, new growth and tuberculosis. The folly of attempting the cure by drug therapy of a urinary infection which is primarily dependent upon one of the above-named mechanical factors, is apparent.

Concerning the systemic or "extra-urinary" predisposing causes of urinary infection, our knowledge is relatively scant and unsatisfactory. There are those cases of pyuria or bacteriuria, occurring during the course of acute infectious diseases; and there is that large group of cases in which it is considered that chronic focal local infection plays a rôle. Whether our predisposing or underlying cause of infection be intra-urinary or systemic, to disregard this primary cause, and to attempt a cure by merely rendering the urine antiseptic, is obviously ridiculous. Therefore, if accurate information is to be obtained, the essential preliminaries in selecting cases suitable for internal urinary therapy are (a) complete general physical examination and (b) complete urological examination. It should be further noted that favorable results cannot be expected in far-advanced cases, as, for example, bilateral pyelonephritis, of long duration, with extensive destruction of renal tissue and lowering of renal function.

In view of the numerous obstacles in the way of obtaining accurate and reliable clinical data, it may therefore be stated that the clinical efficiency of a given "experimental" urinary antiseptic must be determined by the average opinion of a number of competent, unprejudiced observers, each of whom has accurately tabulated results in a series of cases sufficiently large to eliminate the *post hoc, propter hoc* fallacy. As yet no "internal urinary antiseptic" has stood this test.

We are not here primarily interested in a consideration of the value of the ordinary text-book "urinary antiseptics," among which may be mentioned hexamethylenamin, methylene blue, salol, oil of sandalwood, salicylic, boric and benzoic acids. Of these, hexamethylenamin is of some clinical value, but has its very definite and recognized limitations. Certainly, none of the others has solved the clinical problem of infected urine. It is the purpose of this paper to consider briefly the clinical limitations of, and the indications for, the four above-listed "experimental" urinary antiseptics, in order that we may know what facts of practical clinical value have been brought to us by laboratory work upon this subject. To repeat, these four compounds are (1) chlor-mercury fluorescein, (2) acriflavine, (3) mercurochrome, and (4) hexyl resorcinol.

Chlor-mercury fluorescein.—This compound was synthesized as long ago as 1918 by E. C. White at the Brady Urological Institute in the course of an investigation relative to the antiseptic properties and the renal excretion of compounds related to phenolsulphonephthalein (Davis, White and Rosen[2]). It was shown that this organic compound very nearly approaches the experimental ideal, in that the intravenous administration of a single minute dose (5 mgm.) to dogs or rabbits will cause the secretion of antiseptic urine for a definite period

of time (approximately 5 hours). In man, antiseptic urine was obtained following a single dose of 10 mgm. In these experiments the antiseptic value of the samples of urine obtained following drug administration was established beyond question by incubation following inoculation with colon bacilli and staphylococci, and by comparison with control samples of urine previously obtained and similarly treated. The appearance time of this drug in the urine after intravenous administration is even more rapid than that of phenolsulphonephthalein. Its toxicity has been carefully worked out with dogs and rabbits, the antisepsis-producing dose and the lethal dose (in dogs) having the ratio of one to forty. Chlor-mercury fluorescein, however, has never received a thorough clinical trial, chiefly by reason of the question of renal injury resulting from its mercury content, and partly because this investigation was interrupted by our entrance into the war. Recently, the widespread clinical use of large intravenous doses of mercurochrome without evidence of lasting ill effect, has afforded justification for undertaking a further clinical trial of chlor-mercury fluorescein. In this connection, attention should be directed to the rapid and abundant renal elimination of chlor-mercury fluorescein, in contrast with the very small fraction of mercurochrome which appears in the urine.

Acriflavine. — A continued investigation of the antiseptic properties and the renal excretion of compounds related to phenolsulphonephthalein, and of a large number of anilin dyes[6] (a total of more than 400 compounds), led to the discovery of remarkable properties possessed by acriflavine. This drug, in a dilution of 1-100,000 in alkaline (pH 7.4) urine, in a test tube, inhibits the development of the colon bacillus or the staphylococcus. Administered intravenously or orally, to animals or man, it rapidly appears in the urine, and is excreted in large volume. The (alkaline) urine of a normal man, obtained four hours after the oral administration of a minute dose (0.05 gram) of acriflavine, becomes sterile within eight hours after inoculation with colon bacilli. Since half of this dose (0.025 gram) has been administered daily to rabbits for a period of thirty days without ill effect, it is clear that acriflavine fulfils the experimental requirements and gives brilliant promise of clinical value. Subsequent clinical trial, however, has borne out this promise only in small measure, and has served to emphasize the distinction between the experimental and the clinical urinary antiseptic. A published report[7] of the clinical value of acriflavine administered orally to patients with urinary infections was summarized as follows:

1. A large proportion of the patients with acute urinary infections have shown a prompt improvement, characterized by a drop in temperature, a disappearance of bladder symptoms, a macroscopic clearing of the urine and a disappearance of bacteria from the urine. Relapses in these cases have been the exception.

2. Chronic urinary infections have not readily responded. Improvement was noted in only 60 per cent of cases, and in most of these the pus and bacteria reappeared in the urine after discontinuing the treatment.

3. Acriflavine administered orally to patients with acute anterior gonorrheal urethritis is not a dependable prophylactic for preventing the extension of the infection to the posterior urethra.

4. Acriflavine administered orally is of benefit in acute posterior gonorrheal urethritis in lessening the duration and the severity of the acute symptoms.

5. Mild catharsis or slight nausea was observed in approximately 30 per cent of the patients. This was due in part to the bicarbonate, since in some instances these symptoms preceded the dye administration. In 5 per cent of the patients vomiting and diarrhea were such as to contraindicate the use of the drug. No further ill effects have been noted.

6. The indiscriminate use of acriflavine by mouth, in unselected cases, and without regard to the elimination of the "accessory" causes of urinary infection, is distinctly inadvisable.

Mercurochrome.—This compound also was synthesized by White in the Brady Urological Institute in the course of the continuation of the investigations outlined above. Following the original publication by Young, White and Swartz,[5] describing its antiseptic properties, and recommending its use chiefly as a local instillation into the urethra and bladder, mercurochrome has rapidly come to be widely used as a local antiseptic in the various specialties. More recently there has developed a country-wide tendency toward the intravenous administration of mercurochrome in diverse varieties of sepsis. Unfortunately, this use of mercurochrome has not been limited to institutions where there has been opportunity for accurate observation and control, but has been by anybody, anywhere;

and will probably result in reflecting discredit upon the drug. On the other hand, the highly commendable investigations by Young and his co-workers at the Brady Urological Institute, including exhaustive and painstaking studies of a large series of case reports, collected from various observers and accurately tabulated without prejudice, leave no doubt in the minds of the ultra-conservative that in this drug, administered intravenously, we have a valuable therapeutic agent in selected cases of sepsis. In this paper, however, we are primarily interested in the control of urinary infections. Young[8] has also reported improvement in urinary infections following the intravenous administration of mercurochrome, for which there is some experimental basis in the work of Hill and Colston,[9] indicating a bacteriostatic action in the urine of normal rabbits following the intravenous administration of mercurochrome. Only a very small fraction, however, of mercurochrome given intravenously or by mouth appears in the urine, and for this reason mercurochrome would not seem to be as well adapted for the specific purpose of internal urinary antisepsis as is chlor-mercury fluorescein. Isolated instances of clinical improvement of urinary infections have been cited, following the internal use of mercurochrome, yet there has appeared no comprehensive clinical report, conclusively establishing the value of mercurochrome for this purpose.

In the form of a local application, however, mercurochrome is of established and proven value, and for this reason, if for no other, has made for itself a permanent place in our list of useful drugs. As applied in practical urology, mercurochrome is particularly useful as a local instillation into the posterior urethra, the bladder or the renal pelvis. There is a type of cystitis frequently observed in women, characterized by recurrent attacks of frequent urination, with urethral pain and burning, and by the presence of pus cells and colon bacilli in the urine. This clinical picture is frequently observed in general practice. It is in this type of infection that mercurochrome, in the form of daily instillations (10 c.c. of 0.5 per cent to 1 per cent) affords prompt and almost miraculous relief from symptoms. In this connection it should be noted that those cases failing to respond promptly to local treatment deserve complete urological investigation, in order to eliminate the so-called predisposing or accessory causes of chronic bladder symptoms, such as retained urine, stone, tumor, tuberculosis, or renal infection.

Mercurochrome is also a valuable drug in the treatment of chronic prostatitis, used as an instillation into the posterior urethra following massage. In this connection attention should be directed to the penetrating properties possessed by this drug.

Hexyl resorcinol.—Through the work of Leonord,[4] attention has recently been directed to hexyl resorcinol, synthesized by Treat B. Johnson of Yale. Leonard's experimental reports indicate remarkable properties for compounds of this series, in that as the number of carbon atoms in the alkyl side chain is increased there is a corresponding increase in antiseptic value (up to 6 carbon atoms, hexyl resorcinol), and at the same time a *decrease* in toxicity. Phenol coefficient determinations for hexyl resorcinol have averaged 46. Dissolved in either acid or alkaline urine, this compound has been shown to kill colon bacilli in a dilution of 1-10,000 and staphylococci in 1-50,000. Rabbits tolerate a daily dosage of 0.5 gram indefinitely. Leonard has shown that hexyl resorcinol, administered to normal rabbits, dogs and men, appears in the urine, and there exerts an antiseptic action, thus presenting a fourth compound possessing properties essential to the *experimental* internal urinary antiseptic. At the present time, sufficient clinical data have not accumulated to prove or disprove the clinical value of hexyl resorcinol.

CONCLUSIONS

1. There is no known "cure-all" for infections of the urinary tract. In other words, the ideal internal urinary antiseptic, of proven clinical efficiency, does not exist.

2. Drugs with laboratory findings such as to indicate a theoretical clinical value, and which will cause the secretion of the antiseptic urine by normal human individuals, are:

   (a) Chlor-mercury fluorescein, which has not as yet received a thorough clinical trial.

   (b) Acriflavine, which is of distinct clinical value in acute urinary infections, but which gives results in chronic infections which are inconstant, and not permanent. Furthermore, chemically pure acriflavine is obtained with difficulty, and gastro-intestinal symptoms are not infrequent.

   (c) Mercurochrome, which seems to have given good results in some cases, but which is

not dependable. Furthermore, there are severe reactions associated with the intravenous administration of mercurochrome. It is excreted in the urine only in small percentage. Mercurochrome is of definite and proven value in the form of local instillations into the bladder or posterior urethra.

(d) Hexyl resorcinol, which is of splendid experimental promise, but which awaits clinical confirmation.

3. Promiscuous medication with so-called urinary antiseptics without painstaking investigation to eliminate mechanical or systemic causes of infection is distinctly contraindicated.

4. The frequent observation of spontaneous and seemingly causeless exacerbations and remissions in urinary infections, with corresponding variations in the pus and bacterial content of the urine, should prevent hasty conclusions as to the clinical value of a given urinary antiseptic.

5. In this field of endeavor, there is cause for optimism rather than pessimism, for the reason that the one greatest obstacle has been surpassed. It has been conclusively demonstrated, and confirmed by different observers, that there are several chemical compounds which may be passed through the gastro-intestinal tract, the blood stream and the kidney of normal human individuals, rendering the urine an unfit culture medium for micro-organisms, and in no way injuring the body. It has further been shown that in selected cases one or another of these drugs may exert a curative effect upon inflammatory processes in the urinary tract. In this respect there has been a step of progress made.

REFERENCES

1. Davis, Edwin: Urinary antisepsis—A study of the antiseptic properties and the renal excretion of compounds related to phenolsulphonephthalein: Preliminary report. Jour. Am. Med. Assn., 1918, 70, 581.
2. Davis, Edwin; White, Edwin C., and Rosen, Robert: Urinary antisepsis—The secretion of antiseptic urine following the intravenous administration of an organomercury phthalein derivative. Jour. Urol., 1918, 2, 277.
3. Davis, Edwin, and Beck, Gerald H.: Urinary antisepsis—The secretion of antiseptic urine by man following the oral administration of proflavine and acriflavine: Preliminary report. Jour. Urol., 1921, 5, 215.
4. Leonard, Veader: Secretion of bactericidal urine and disinfection of the urinary tract—Following oral administration of certain alkyl derivatives of resorcinol. Jour. Am. Med. Assn., 1924, 83, 2005.
5. Young, H. H.; White, E. C., and Swartz, E. O.: A new germicide for use in the urinary tract: "Mercurochrome - 220": Preliminary report of experimental and clinical studies. Jour. Am. Med. Assn., 1919, 73, 1483.
6. Davis, Edwin: Urinary antisepsis—A study of the antiseptic properties and the renal excretion of 204 anilin dyes. Am. Jour. Med. Sc., 1921, 161, 251.
7. Davis, Edwin: Urinary antisepsis—Clinical results following the oral administration of acriflavine. Jour. Urol., 1924. 11, 29.
8. Young, H. H.: Urinary antiseptics. Jour. Urol., 1924. 11. 19.
9. Hill, J. H., and Colston, J. A. C.: A note on the bacteriostatic action of urine after the intravenous administration of mercurochrome to normal rabbits. Bull. Johns Hopkins Hosp., 1923, 34, 220.

FOOD SELECTION FOR THE YOUNGER GENERATION

The time-worn question, "What shall we eat?" has been attacked from a new angle in a Government bulletin written for junior homemakers. Miscellaneous Circular 49, "A Guide to Good Meals for the Junior Homemaker," recently published by the United States Department of Agriculture, approaches a group not previously appealed to in the literature of nutrition.

The authors, Ruth Van Deman and Caroline L. Hunt, are specialists in the Bureau of Home Economics. They have presented the essential facts about foods in popular discussion. A novel introductory paragraph suggests that if all kinds of foods in the world were to be assembled in one market where people of all races came to buy, the combinations they chose would have similar food value though made up of very different foods. For instance, the Japanese might select fish, rice, certain legumes, soja sauce, bamboo sprouts, and persimmons, while the American chose meat, eggs, milk, bread, a variety of American fruits and vegetables, but each would have the makings of a well-balanced diet. The youthful readers are introduced to the term "calorie" in such a way that it can no longer hold any mystery for them. They are also advised to keep track of their weight, to drink at least a pint of milk a day, to include an abundance of vitamins and minerals (from the vegetable and fruit group), and to limit the quantity of sweets used.

The circular containing these valuable suggestions to homemakers of the future may be had while the supply lasts by writing to the United States Department of Agriculture, Washington, D. C.—U. S. Department of Agriculture.

HEXYLRESORCINOL IN URINARY TRACT INFECTIONS IN WOMEN

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Since the presentation of Leonard's report concerning his researches on urinary tract disinfectants there has been great interest in the clinical trial of hexylresorcinol. Estimates of its value by different men have varied. It is obvious that careful observation of a large number of patients over a considerable period of time will be necessary before the drug can be fairly evaluated by the profession. It is towards this end that I am recording a few cases in detail.

All of the cases reported are those of ambulatory patients selected from my private practice. The drug has not been used as the sole therapeutic agent; however, I believe that the detailed report will be of interest. Specimens for culture and smear were obtained by catheter, under aseptic conditions. The cultures were reported on by Dr. Floyd Grave and in no case were declared sterile until incubated at least seventy-two hours.

The drug used was furnished by Dr. Leonard in four preparations, namely: enteric coated capsules, enteric coated pills, a 25 per cent solution in olive oil contained in gelatin capsules, and 2.5 per cent solution in olive oil for administration to infants and children. In the more recent cases the drug was purchased in the market. Of the three preparations used for adults there is no doubt in my mind of the superiority of the one which is now on the market, namely, 25 per cent solution in olive oil contained in gelatin capsules.

All patients were directed to take the drug immediately after meals, and to increase the dose to the maximum slowly. In most cases one capsule three times a day after meals for three days was ordered and the amount gradually increased until the full dose of four capsules three times a day, after meals, was reached about the eighth or tenth day. In this way gastric and intestinal irritation is minimized. I have been surprised to find that some patients noticed more or less constipation after the first week or two.

In two of the patients, the urine showed albumin and casts before treatment, which continued to be present during the course. One of these had an acute exacerbation of cardio-renal symptoms which may possibly have been brought on by the use of the drug. A patient of this type should be under close observation during treatment.

STREPTOCOCCUS INFECTIONS

Case 1.—Miss E. L. T. Age 41. White. Milliner.

Diagnosis.—Chronic urinary infection. Ureteral strictures, right.

Duration.—Six years.

This woman had been explored and no pathological condition found in the abdomen to explain her symptoms.

Bladder urine shows a few pus cells and streptococci in smears and in pure culture.

Right kidney urine contains no pus cells and no bacteria. Cultures sterile. Left kidney urine contains no pus cells and no bacteria. Cultures sterile.

X-ray shows no evidence of stone. Ureteropyelogram shows a narrowing of the ureter beginning 4 cm. below the ureteropelvic junction and extending downward 5 cm. and narrowing again below the pelvic brim. Wax bulbs repeatedly showed very definite resistance at both of these areas. On one occasion I was unable to get through the lower stricture and twice the bulb was stopped in the upper stricture. She also complained of two points of pressure which she localized over the stricture areas.

Differential 'phthalein.*

	Left	Right
Appeared	4 min.	4 min.
Amount	65 c.c.	60 c.c.
Per cent	11.2	11.2
Concentration	1	1

Streptococci were invariably found in smears and cultures from the bladder urine before treatment with hexylresorcinol, while the kidney urines were always sterile and no bacteria were found in smears.

Treatment.—From July 15 to September 27 she was treated with dilatation of the right ureter and instillation of silver nitrate solution into the kidney pelvis and three times a week bladder instillations of silver nitrate, silvol, or mercurochrome.

September 26, 1924. Hexylresorcinol (enteric coated capsules), gr. 5, t.i.d.,p.c. was begun.

September 27. After taking 25 grains, the urine showed a very large number of streptococci which were probably dead organisms, as the culture was sterile.

September 29. After taking 55 grains, the patient had to cease medication on account of nausea and intestinal cramps. Culture remains sterile and only four coeci were found in the smear.

September 30. Culture reported Gram positive diplococcus. Smears show a few cocci. Hexylresorcinol, gr. 5, t.i.d.,p.c.

October 1. Culture reported Gram positive diplococcus. No organisms found in smears.

October 2. Culture on agar sterile, in broth, contaminated. No organisms in smears.

*In each case in which the phenolsulphonephthalein functional test was performed, 1 c.c. of the dye was injected intravenously and the output from each kidney collected twenty minutes. Notation is made when the bladder was found to contain a specimen at the end of the twenty-minute period.

October 4. Discontinued hexylresorcinol.

November 15. Smears show no organisms.

December 2. Tonsillectomy. Shortly after tonsillectomy, her nocturia increased from once to three times. She voided twice as often during the day as before and had more burning than at any time since she had been under treatment. No organisms found in smears.

December 23. Very uncomfortable since last visit. Culture sterile and no organisms found in smears.

January 9, 1925. A few short chained streptococci found in smears.

January 22. Hexylresorcinol, 25 per cent solution in olive oil, 0.15 gm. t.i.d.,p.c.

January 24. Hexylresorcinol, 0.30 gm. t.i.d.,p.c.

January 26. Hexylresorcinol, 0.45 gm. t.i.d.,p.c. Complains of eructation of gas and a sour stomach.

January 28. Hexylresorcinol, 0.60 gm. t.i.d.,p.c.

February 2. Stopped taking hexylresorcinol.

February 19. Cultures and smears show no organisms.

February 21. Cultures and smears show no organisms.

February 23. Cultures and smears show no organisms.

November 23. Patient left the city after last visit, but writes that she still has her pressure symptoms over the strictured areas in the right ureter.

Case 2.—Mrs. M. T. B. Age 30. Housewife. White. Two children.

Diagnosis.—Acute urinary tract infection.

Urine from bladder cloudy, acid, no albumin, no sugar, no casts, some pus cells, no red blood cells. Streptococci in smears and in pure culture.

X-ray showed no evidence of stone.

When first seen, January 22, 1925, had had frequency and dysuria for one week. Two days later began having severe pains in both kidney regions, which continued with decreasing severity for one week.

Treatment. — January 29, 1925, began hexylresorcinol (25 per cent solution in olive oil), 0.15 gm. t.i.d.,p.c., gradually increased to 0.45 gm. t.i.d.,p.c., with no symptoms from the drug except that she thinks her breath is bad.

February 3. Patient took 0.60 gm. of hexylresorcinol a half hour after a breakfast of one cup of coffee and a slice of toast. Half an hour after taking the drug she had a severe pain beginning in the right kidney region, extending forward and spreading over the entire abdomen, accompanied by an intense desire but inability to defecate. These pains lasted about two hours.

February 12. Began hexylresorcinol again, having discontinued the drug on the 3rd.

February 16. Yesterday took no hexylresorcinol and today after breakfast of a cup of coffee and a half slice of toast took 0.45 gm. One hour later was seized with violent pains in the right back and abdomen which lasted about an hour, and for several hours after a slowly decreasing pain in the lower right quadrant, radiating into the vagina. Smears and cultures of the bladder urine show no bacteria. No blood.

November 2. Has been entirely free of urinary tract symptoms since last visit.

URINARY INFECTION DUE TO A GRAM NEGATIVE DIPLOCOCCUS (UNCLASSIFIED)

Case 3.—Mrs. W. F. J. Aged 52. Housewife. Never pregnant.

Diagnosis.—Acute urinary tract infection.

This patient was treated in the spring of 1925 for a chronic urinary tract infection of two years' duration. At this time a Gram positive coccus was repeatedly obtained from the bladder urine in pure culture and also in smears. Urine sterile on several occasions during summer and complete relief of symptoms.

October 7, 1924. Sudden onset of frequency, urgency, and dysuria.

October 9. Smears show a few Gram negative cocci, numerous pus cells, no red blood cells, no casts. Cultures on agar and broth remain sterile.

October 14. Smears show Gram negative cocci and a few pus cells. Cultures on blood agar and blood broth remain sterile. Hexylresorcinol, gr. 5 (enteric coated capsules), t.i.d.,p.c.

October 17. Smears show a large number of Gram negative cocci in clumps, few pus cells. Culture sterile. Hexylresorcinol, gr. 5, t.i.d.,p.c. Has had a slight looseness of the bowels but no cramps.

October 20. Smears show no organisms and no pus cells. Hexylresorcinol was continued for two days longer with no further symptoms of irritation.

November 4. Has had no further bladder symptoms.

MIXED INFECTIONS

Case 4.—Mrs. T. B. Age 83. White. Widow. Four children.

Diagnosis.—Chronic urinary infection.

Bladder urine very foul smelling, cloudy, alkaline, contains large amounts of pus, no red blood cells, very numerous long slim bacilli, some diplococci, no casts. Cultures show a long slender Gram negative bacillus and a Gram positive diplococcus.

Treatment.—All treatment except hexylresorcinol refused.

Hexylresorcinol, 0.15 gm. t.i.d.,p.c. for one week and increased to 0.30 gm. t.i.d.,p.c., which she took for about a week. This old lady did not return to the office, but wrote me that she had to stop the drug on account of severe constipation and loss of weight, and that she "could not eat more than a mouthful of food at a meal."

Case 5.—Mrs. E. M. S. Age 41. White. Housewife. Widow. Never pregnant.

Diagnosis.—Chronic urinary tract infection.

Had had attacks of bladder trouble off and on since 1916. At the onset of each attack had a little hematuria. Had an attack in January, 1924, following removal of tubes and left ovary for bilateral hydrosalpinx and pelvic adhesions. B. coli was isolated from the urine at this time. Cystoscopic examination June 9, 1924. Kidney pelves normal in size; ureteral orifices small. Bladder was normal except for very slight redness around right ureteral orifice. Urethra injected.

Urine specimens collected from bladder, right kidney and left kidney show no bacteria, no pus cells.

Differential 'phthalein (syringe cracked and some of the contents were lost).

	Right	Left
Appeared	6 min.	6 min.
Amount	12 c.c.	6 c.c.
Concentration	6	6
Per cent	15	7.5

The bladder at the end of twenty minutes' period contained 14 c.c. of urine with a concentration of 1 and percentage of 3.

December, 1924. Has had frequency and bladder discomfort constantly for over a year. Supravaginal hysterectomy and large cyst of right ovary removed. Later cauterization of cervical canal. Following operation, bladder symptoms became much worse. Cultures and smears made showed B. coli and considerable pus. Treatment with bladder instillations of silver nitrate three times a week.

January 16, 1925. Cultures and smears show a short chained streptococcus. No B. coli present.

January 22. Cultures and smears show pure culture of short chained streptococcus. Hexylresorcinol, 0.15 gm. t.i.d.,p.c.

January 24. Hexylresorcinol, 0.30 gm. t.i.d.,p.c. Has had slight constipation. Cultures in three tubes and smears all show short chained streptococcus.

January 29. Hexylresorcinol, 0.45 gm. t.i.d.,p.c. Streptococci in smears. Streptococci and a few Gram positive diplococci in culture.

February 10. Hexylresorcinol, 0.45 gm. t.i.d.,p.c. Smears show streptococci.

February 18. Culture and smears show streptococci.

March 4. Culture remains sterile and no organisms found in smears.

March 6. Culture remains sterile and no organisms found in smears.

The patient continued on hexylresorcinol for a week longer and afterwards was free from symptoms except for a few days in July, when she had slight burning and she again took hexylresorcinol for a week or two. There was no examination made at this time.

November 4. Smear shows no pus, no blood and no organisms. Culture shows a few colonies of a Gram positive micrococcus, much smaller than staphylococcus or streptococcus. The colonies appeared after forty-eight hours in the incubator and Dr. Graves thinks it is a contamination.

Has had no symptoms since the slight burning in July. The patient states that she feels better than she has for the last ten years.

B. COLI INFECTIONS

Case 6.—Mrs. W. F. M. Age 42. Housewife. White. No pregnancies.

Diagnosis.—Cystitis, chronic; urethritis, chronic; pyelitis, right, chronic.

Urinary tract symptoms for seven years. Two gynecological operations without relief and two resections of the bladder for ulcer with marked relief of dysuria.

Still has frequency (thirty to forty times in twenty-four hours) and urgency. Urine from the bladder shows trace of albumin, no sugar, acid, clear, no casts, few clumps of pus cells, no red blood cells, very numerous bacilli. B. coli in pure culture.

Blood chemistry.—Urea nitrogen, 13.99 mg. per 100 c.c.; creatinine, 1.88 mg. per 100 c.c.

Differential 'phthalein.

	Right	Left
Appeared	4 min.	4 min.
Amount	35 c.c.	35 c.c.
Concentration	1	1
Per cent	17	15

Treatment.—Patient refused cystoscopic treatment. Considerable relief from frequency by bladder and urethral instillations of silver nitrate. This patient was given hexylresorcinol on several occasions, but apparently could not take more than 0.15 gm. t.i.d.,p.c. without severe cramps and diarrhea. She did not seem to be able to establish a tolerance.

Case 7.—Baby L. Age 8 mo. Female. White.

Diagnosis.—Urinary tract infection. Duration about two months.

Bladder urine contains numerous pus cells and bacilli. Pure culture of B. coli.

Treatment.—Bladder irrigations and instillations of silver nitrate or mercurochrome, 0.25 per cent.

Hexylresorcinol, 0.025 gm. (2.5 per cent solution in olive oil) t.i.d.,p.c., increasing to 0.10 gm. t.i.d.,p.c. This was tried several times, but after two or three days the baby would vomit frequently. Vomiting ceased with discontinuance of the drug.

Rectal administration was unsuccessful.

Case 8.—Mrs. E. A. M. Age 64. Housewife. White. Four children.

Diagnosis.—Cystitis, chronic; hydronephrosis, chronic, right, infected; nephrolithiasis, right (stone in pelvis of kidney evidently causing partial obstruction). Probable duration many years.

Urine from bladder very cloudy, acid, 1.018, no sugar, trace albumin, a few hyaline casts, many pus cells, no red blood cells and very large numbers of bacilli. B. coli in pure culture.

Urine from right kidney similar to that from bladder. Urine from left kidney contains no bacteria in smear or culture and no pus.

X-ray shows an oval stone in a greatly enlarged pelvis of the right kidney at the ureteropelvic junction and clubbed calices.

The right pelvis held 60 c.c. without pain or leakage into the bladder.

Phenolsulphonphthalein test. One c.c., intramuscularly, appeared in seven minutes. Two hundred and eighty c.c. collected during the first hour read 35 per cent and 90 c.c. collected during the second hour read 20 per cent. Total 58 per cent.

Differential 'phthalein test.

	Right	Left
Appeared	9 min.	6 min.
Amount	38 c.c.	60 c.c.
Concentration	2	3
Per cent	6	13.5

Blood pressure varies from 175 to 190 systolic, 80 to 90 diastolic.

Treatment.—Pelvic lavage eight times, using large catheters. Bladder lavage and instillation of mercurochrome or silver nitrate three times a week. No improvement after two months.

January 23, 1925. Hexylresorcinol (25 per cent in olive oil), 0.15 gm. t.i.d.,p.c., increasing to 0.6 gm., and the full dose continued for one hundred days. The only symptoms from the drug were a little eructation of gas and slight nausea one day, mild constipation part of the time and diarrhea one day at the end of the third week. No increase

of albumin or casts and no red blood cells appeared at any time during the treatment.

July 30. Very little improvement in microscopic picture of urine.

Case 9.—Mrs. Q. Age 61. White. Social worker.

Diagnosis.—Chronic infection of bladder and right kidney pelvis of two years' duration.

Urine from bladder cloudy, sp. gr. 1.014, albumin none, sugar none, pus cells, no red blood cells, no casts. Pure culture of B. coli.

Urine from right kidney shows some pus cells, a few red blood cells (traumatic) and a pure culture of B. coli.

Urine from left kidney contains no pus cells, no bacteria. Culture remains sterile.

X-ray shows no evidence of stone in the urinary tract.

There was a slight obstruction to a No. 6 flute tipped catheter just above the right ureteral orifice.

Differential 'phthalein.

	Right	Left
Appeared	5 min.	5 min.
Amount	11 c.c.	7.5 c.c.
Per cent	12.5	17.5
Concentration	1	2

Treatment.—On catheterization of ureters, instillation of 1-1,000 silver nitrate solution in pelves of both kidneys and bladder.

March 17, 1925. Hexylresorcinol, 0.15 gm. t.i.d.,p.c., gradually increasing to 0.60 gm., but she dropped back to 0.45 gm., as she has "a strange feeling of exhilaration" when taking the full dose, but no other symptoms. Four hundred capsules in all taken.

November 10. Specimen obtained after cleansing meatus carefully and catching the stream in a clean vessel without contamination from the external genitalia. Patient would not permit catheterization. This specimen was examined very carefully and showed no pus cells and no bacteria either in fresh or stained smear.

The patient has not taken a dose of the drug for two months. She reports that she works sixteen hours a day and feels absolutely well. She now has no nocturia, no frequency and no dragging feeling.

Case 10.—Mrs. S. J. H. Age 60. Housewife. White. Widow. Two children.

Diagnosis. — Cystitis, chronic; pyelitis, left; nephritis, chronic, with hypertension. Duration six years. Large cystocele and prolapse of uterus.

Urine from bladder cloudy, acid, 1.013, trace of albumin, no sugar, some pus cells, no red blood cells, some hyalin and finely granular casts and bacilli. Pure culture of B. coli.

Urine from left kidney contains some pus cells, hyalin and finely granular casts and numerous bacilli. Pure culture of B. coli. Urine from right kidney contains no pus cells, no organisms, hyalin and finely granular casts. Culture sterile.

Differential 'phthalein.

	Right	Left
Amount	25 c.c.	32 c.c.
Concentration	22	15
Per cent	4.5	.75

X-ray shows no evidence of stone in the urinary tract.

Pyelo-ureterogram, left. Slightly dilated pelvis, some clubbing of the calices and constriction of bases of calices.

Treatment. — Pelvic lavage at the time of cystoscopic examination. Bladder instillations of silver nitrate three times a week until April 20, 1925. A pessary was fitted which gave her great relief from symptoms of prolapse.

Hexylresorcinol, 0.15 gm. t.i.d.,p.c., gradually increasing to 0.60 gm. after ten days. This patient took two hundred gelatin capsules (0.15 gm. of hexylresorcinol, 25 per cent in olive oil) in all.

May 1, 1925, she began complaining of weakness, dizziness and an "all gone feeling." Examination by Dr. Woodward showed blood pressure 160–120, and a voided specimen of urine contained a large number of hyalin casts, cylindroids, mucus, and a few pus cells.

November 18. Patient reports that after she recovered from her attack in May she has had no bladder symptoms. She can now eat any of the foods such as pickles, acid fruits, etc., which aggravated her bladder symptoms before.

Urine from the bladder shows no organisms, no red blood cells, no pus cells, some hyalin and granular casts. Culture sterile.

DISCUSSION OF CASES

Case 1.—This case of multiple strictures of the right ureter with streptococcus infection presents two very interesting features. Twenty-four hours after starting treatment with hexylresorcinol the urine was found to contain very large numbers of streptococci which were presumably dead, as the cultures remained sterile. Two months after disinfection of the urinary tract was complete, the tonsils were removed. This was followed by a urinary infection due, again, to a streptococcus which cleared up after about three weeks' treatment with hexylresorcinol. The patient still complains of discomfort which she refers to the strictured areas in the right ureter.

Case 2.—Acute urinary infection due to streptococcus. This patient experienced abdominal pains while taking the drug after very small amounts of food. The urine became sterile. Nine months later she had had no further trouble.

Case 3.—In this case, in which the infection was due to a Gram negative coccus, rapid relief of symptoms and sterilization of the urine followed a short course of hexylresorcinol.

Case 4.—An elderly woman, aged 83 years, could not take the drug. The symptoms which caused the patient to stop treatment were probably due entirely to constipation.

Case 5.—A chronic urinary tract infection by B. coli followed by the disappearance of this organism and the appearance of streptococci and a

Gram positive diplococcus. Disinfection of the urinary tract with complete symptomatic relief which appears to be permanent (8 months) followed a course of seven weeks' treatment with hexylresorcinol.

Case 6.—This patient could not establish a tolerance to hexylresorcinol even in small doses and treatment had to be given up.

Case 7.—An infant of eight months. The drug caused vomiting after two or three days and had to be given up.

Case 8.—A case of chronic B. coli infection with hydronephrosis and stone. A course of a one hundred days' treatment with full doses of hexylresorcinol resulted in very little improvement in the microscopic picture of the urine. Poor urinary drainage was a very unfavorable factor in this case.

Case 9.—A case of chronic cystitis and pyelitis, right, of two years duration, due to B. coli. Complete disinfection of the urinary tract followed a course of four hundred capsules of hexylresorcinol.

Case 10.—A case of chronic cystitis and pyelitis, left, due to B. coli. Complete disinfection of urinary tract followed a course of two hundred capsules of hexylresorcinol with bladder instillation of silver nitrate.

COMMENT

For the reason that acute infections of the urinary tract frequently subside spontaneously it is dangerous to attribute a favorable result in this type of case to drug therapy. This is not true, however, of the chronic infections and especially those due to organisms of the B. coli group. Of the three chronic B. coli infections reported, in which treatment was continued for a reasonable period of time (cases 8, 9, and 10), one was not influenced. In both of the others, treatment was followed by complete symptomatic relief and sterilization of the urinary tract as shown by urine culture.

The coccal infections seem to be more susceptible to the drug than those due to the bacillary forms.

A few of my patients have complained of backache in the region of the kidneys from time to time. It seems probable that this was due to the disease rather than to the treatment. In one case only (Case 6) was there any suggestion of kidney irritation.

It is important to begin treatment with small doses, increasing them gradually. Gastro-intestinal irritation, which was a troublesome feature with the earlier forms of administration, is usually not severe and is of short duration with the olive oil preparations now on the market. The drug should always be administered immediately after meals. An occasional patient will not be able to establish a tolerance.

Some constipation was noticed by most of my patients after the first week or two of treatment.

The continued use of full doses over a considerable period of time is often necessary for a successful result. During treatment, the use of alkalies, especially sodium bicarbonate, should be avoided and the fluid intake should not be increased in order that a sufficient concentration of the drug in the urine may be obtained.

Alternating courses of hexylresorcinol and other urinary antiseptics has seemed to be unsuccessful.

The clinical evidence reported supports the claim that hexylresorcinol exerts a distinct antiseptic action in the urine of patients suffering from urinary tract infections whether due to coccal or bacillary infections. This action is apparently sufficient to completely disinfect the urinary tract in some cases.

REFERENCES

Leonard: Jour. Am. Med. Assn., lxxxiii, 2005, Dec., 1924.
Leonard: Jour. Urol., xii, 585, Dec., 1924.
Henline: Jour. Urol., xiv, 119, Aug., 1925.
Braasch: Minn. Med., viii, 313, May, 1925.

OTHER STATES BUILD MORE

So far as the buildings which have been erected at the expense of the state are concerned, it should be said that while Minnesota has been liberal in this respect, a number of our neighboring states have appropriated much larger sums for buildings over shorter periods of time than has Minnesota. The state of Michigan appropriated to the University of Michigan more than $8,000,000 for buildings during the last four years. The state of Iowa has appropriated in the neighborhood of $4,000,000 for buildings for the University during the last four years. The amount appropriated by the state of Illinois for buildings at the University of Illinois during the last biennium was $2,500,000. A similar request is being made for the next biennium. Ohio has a building program of $8,000,000 to be submitted at this next legislature. The program at Minnesota, if it continues to develop as it is now developing, will not be a burden upon the state at any time. We should be able to build in accordance with our actual needs, and to have ample time to study our problems. There will be no extravagances or lavish expenditures. Progress will be made wisely and intelligently. The Legislature is to be commended for having adopted this plan.—President L. D. Coffman, *Minnesota Chats*, Feb., 1926.

UROLOGY IN SURGICAL DIFFERENTIAL DIAGNOSIS*

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The technic of surgical operations has developed to a remarkable degree in the last two decades. Hand in hand with the advance of surgical technic, and its extended field of safe therapeutic procedure, has come a greater knowledge of living pathology, brought about by the opportunity offered surgeons to observe and classify diseases in their actual progress, as well as the positive proof of their location and extent, permissible by actual observation of the exposed tissues and organs.

A further advance which is the object of the present endeavors of research workers, and which is put into useful application by the surgeon in his daily work, is the study and employment of biological factors in physiology and pathology; so that today the science of structural changes is augmented by that of functional capacity, in that the body as a whole, rather than the local organ of attack, is the criterion of properly timed and distributed therapeutics.

Let us speak of surgery in a larger sense than the work of the individual operator who merely does the mechanical work of cutting, sewing, removing, anastomosing or draining. As Dr. Wm. J. Mayo so aptly puts it, "the surgeon is a therapeutic measure, like a dose of digitalis, prescribed and planned for by his associates—the internist, pathologist and bacteriologist, and the specialist in other lines." Many times the surgeon must possess and apply the working knowledge of any or all of these.

Not only has surgery been the means of advanced therapeutic measures, but it has opened the door to better structural and functional diagnosis; the opportunity has been given to the internist, bacteriologist, pathologist and specialists in other fields to co-operate in the better understanding of the etiology, location, extent, progress, climax and end-results of many hitherto obscure lesions, which were as a hidden book, or understood only in an empirical way.

Just as the accumulated knowledge of the various specialties has made for a better handling of the problems at hand, so modern surgery demands a broader knowledge of the surgeon in the specialties, in order to make a better and more exact diagnosis, and consequently to allow him to do a more purposeful operation. It takes training in technic only, to make a good operator, but it requires a deep and broad knowledge of health and disease to make a good surgeon. Diagnosis, preparation for operation, good technic and persistent after-care and follow-up form the path which must be followed in the field of good surgery today.

In the large clinic, or where good co-operation between surgeon, physician and the various specialists is at hand, diagnosis is more easily made. The surgeon who pursues his daily work under average conditions must himself have a working knowledge in special fields to become satisfactorily proficient; just as the internist must use and interpret the ophthalmoscope, electrocardiogram and *x*-ray, so the surgeon today must possess knowledge in the special fields. To do good goiter work he should know the physiology and pathology, as well as the anatomy of the thyroid and associated organs; he must know the interpretation of the rate of metabolism, the type and stage of the disease, and the indications for drug therapy, *x*-ray, rest cure, dietetics, and operation, as well as the type and extent of operation.

Chronic liver infections in which surgery is indicated should have careful preparatory study and treatment, with reference to liver function, bile infection, blood coagulation, and functional activity of the cardio-renal system, before operation is done. The diabetic who formerly was a bad surgical risk can be put on a safe basis for surgical attack by checking and adjusting the sugar and acid balance in the blood with diet, insulin and alkalies, grading the dosage with the help of the laboratory, and according to the individual response; thus a diabetic is as safe as another patient for surgical work.

A patient with acidosis or ketosis, due to severe surgical infection in the non-diabetic, may likewise be carried over to safe operation and recovery by the timely use of glucose, soda and insulin, under laboratory and clinical control.

Taking for granted the need of proper and exact surgical technic, it is equally or perhaps more important to acquire the personal training, or to associate ourselves with our colleagues in the other specialties in the making of exact organic and functional diagnosis. The present field of development

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in biology, physiologic, as well as pathologic, will lead us into better diagnosis, and tell us where and when to operate; it emphasizes more than ever before the great importance of patient and careful preparatory, as well as scientific after-treatment, putting these on a par with mere surgical technic.

This broader view of surgery is in contrast to the regrettably large class of operative work, which begins with the physician who for a fee or commission refers his cases to an operator, who, accepting a snap diagnosis, or one made with poor facilities and limited means of observation, accedes to demand for immediate operation; for fear of losing the case a hurried, incomplete or misplaced operation is done. This is "operating," but not the work of a true surgeon.

Urology as a specialty has been developed in the last decade or two to an enviable position in science. Many illustrious names are interwoven in the story of the development of the diagnostic and operative instruments used in this work; the laboratory has given us great help with blood chemistry and functional tests of the urine; the *x*-ray specialist is doing marvelous team-work along these lines. The surgeon, who is on the firing line, has at his command this wonderful array of diagnostic equipment to bear on his work.

In the conditions that the surgeon is called upon to treat, it is often necessary to differentiate urologic findings. Many an appendix has been removed when the real cause of the trouble is a calculus lurking in the ureter. Useful and harmless female generative organs have been sacrificed before a ureteral kink or stricture was discovered and remedied. Because of relatively obscure symptoms or reflected signs, and the occasional difficulties attendant upon diagnostic technic, the simpler and more common operations might be hastily done, while the real and more obscure cause is overlooked. Needless pain and expense and the loss of time are offered up on the altar of ignorance and haste, and life is endangered when a vital member of the urologic system is strained by the anesthetic, or the operative shock of an unhappily chosen time or field of attack.

With these preliminary remarks, I wish to show a small series of illustrative cases as they occur in the practice of the general surgeon. They show the importance of urologic consideration in the field of surgical diagnosis. These cases were referred with other diagnosis than the true one or primarily appeared to be something else.

Case 1.—Mrs. L. J. M. Age 29, married. Referred with right abdominal pain, suspected of having appendicitis. Among other things, history evolved nocturia, with no day frequency, right lumbo-inguinal pain, radiating to external urethra. Some pain all the time, with paroxysms of acute pain. Cystoscopy showed a mild general cystitis and a swollen right ureteral opening. Catheterization showed six pus cells per field in the uncentrifuged specimen. Kidney lavage with internal medication brought about a prompt recovery.

This case illustrates the type of pyelitis which we often find and which may be mistaken for disease of other abdominal organs.

Case 2.—C. M. McN. Age 56. Comes with symptoms of urethral stricture and irritable bladder. There is a cystitis present, with pus and red blood cells. He has a stricture of the meatus, with a slight hypospadias. Meatotomy under local anesthesia allowed the passage of steel sounds to and including F26 with little discomfort. Cystoscopy showed a moderate cystitis, with moderate sized diverticulum. This was corroborated by cystogram. One can note the indentation produced by a moderately enlarged prostate, with several opaque shadows. Irrigation of the bladder caused improvement, with practically normal function.

This case illustrates the fact that all bladder obstructions are not due to the prostate, and that we also find a tight meatus responsible for obstruction, bladder irritability and even kidney infection.

Case 3.—Mr. F. C. Age 59. Comes because of nocturnal incontinency and a frequency of eight to ten times a day. Febrile attacks with chills ten days previously, with abdominal soreness. A history of bladder disturbance for ten years, with incontinence within the last year. Per rectum one can feel an enlarged, soft prostate. Blood pressure 185/110; pyorrhea. The urine shows 4 plus pus cells, clumped, specific gravity 1,020; otherwise o. k. Blood creatinin 2.55; non-protein nitrogen 52; urea nitrogen 24.2; Kollmer negative. Cystoscopy shows a mild general cystitis, a moderate trabeculation, shallow diverticulum present in both ureter regions and a large wide diverticulum in the apex. The right ureter was obstructed 1 cm. from the os. The cystogram shows irregular walled bladder with multiple diverticuli, with long narrow tongue of bladder, extending upward and forward in the region of the apex. Diagnosis: Hypertrophied prostate (causing obstruction), diverticuli, cystitis, poor kidney function. Drainage with retained catheter for several days was used; then a suprapubic cystostomy was done, keeping the elbow tube plugged and decompressing slowly over a period of several days. However, the kidney condition, and the patient's general condition did not improve, and patient gradually succumbed with uremia; in spite of the routine treatment with glucose and soda per rectum acidosis developed and death ensued three weeks after he first came under observation. He never reachd the stage of prostatectomy, and the decompression that was used was only sufficient for the patient's

physical comfort. A few days after decompression, his creatinin was 2.9, urea nitrogen 88.9, p.s.p. function less than 5 per cent in two hours. (See Fig. 1.)

This case illustrates the importance of observing the physiological function of the patient. Operation was contraindicated and not done for that reason.

Case 4.—Mr. J. K. Age 65. Referred because of bladder irritation, with retention. Gives a history of having had swelling in the region of the right kidney fifteen years before, which after a week drained into the bladder with discharge of pus and blood. While generally well, he has had more or less irritation since then. Cystoscopy showed narrow urethral meatus, requiring dilatation to pass a F24 cysto urethroscope. Bladder contains shreds of mucus. Sphincter margin is irregular, edematous inflammation extending throughout the whole deep urethra. Ureter orifices are enormously dilated. Urine contains 4 plus clumped pus cells and few red cells. Kidney outlines on *x*-ray showed no calculi but some enlargement of the left kidney. A cystogram made in the right and left oblique position turned out to be a beautiful cysto uretero-pyelogram. The 20 per cent sodium bromide solution injected into the bladder entered both ureters and the renal pelves. Both ureters markedly tortuous and dilated. When he lay in the left oblique position, the left ureter filled. and lying in the right oblique position, right ureter filled. Two days later, under cystoscopy, one could see a very interesting picture. The bladder, because of previous lavage, was clearer; both ureter orifices appeared to be very large, so that the cystoscope could be thrust into the orifice. The current of urine containing mucus would be drawn up and down into and out of the ureter with respiration, creating a distinct current to and fro, just as if a suction syringe were attached to the upper end of the ureter, pulling in the current, followed by the expulsion of the current. In other words, the kidney pelvis, ureter and bladder were one large cavity, with no physiological sphincter or other control. Generally, the patient had a blood pressure of 110/60, with 101.5° fever. His blood creatinin was 3.1; non-protein nitrogen 168 and urea nitrogen 78. Nothing was done but bladder and ureter lavage and general treatment. The patient succumbed to uremia, with diagnosis of chronic bilateral hydronephrosis, with failure of kidney function, and bladder retention. No doubt for fifteen years this condition has been coming on, until the function of the kidneys was so low that the patient could not recuperate.

This is another case illustrating the importance of observing kidney function and avoiding operation if it does not reach a safe margin.

Case 5.—Mrs. O. S. Age 40, married. Referred with history of having been treated for gallstone colic for over a year, and then referred because of suspected kidney colic. This patient had an alkaline urine, with pus cells 4, hemoglobin 78 per cent, w.b.c. 9,300. *X*-ray showed a calcified area in the region of the bladder, 3x6.5 cm., apparently vesical calculus, and suspicious shadows in the kidneys. Cystoscopy showed the bladder wall to be covered with encrustations, and large stone as big as a hen's egg, 6x3 cm. The urine was foul and ammoniacal. Because of the condition of the bladder and the size of the stone, suprapubic cystotomy was done, and the stone removed. The encrustations were scooped off the whole bladder wall, drainage instituted, the patient put on hexamethylen, with large doses of acid sodium phosphate, as well as the inorganic acids internally, and the bladder lavaged. The reaction could not be changed, however, until the patient's diet was so arranged as to give her only acid-producing foods, including meats, eggs, oatmeal, and eliminating alkaline-producing foods, giving her large quantities of water—a glassful every hour. Then the urine became acid and the bladder condition improved. Patient was sent home and returned at intervals for kidney lavage through the cystoscope, so that nine months later the urine was acid, and there was no sign, by *x*-ray, of stone in the bladder or either kidney. In other words, a bad infection of both kidneys

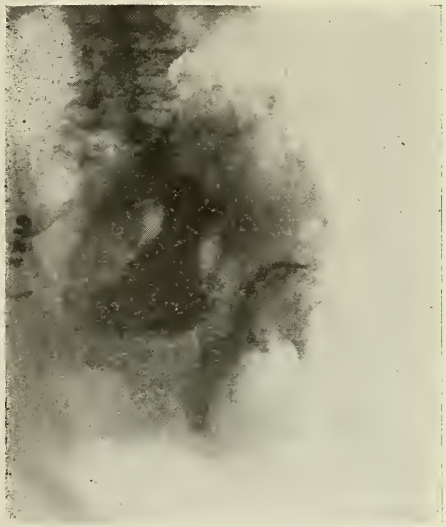


Fig. 1. Case 3. Small diverticula of bladder and elongated bladder extending towards apex, simulating diverticulum. Oblique view.



Fig. 2. Case 5. Large bladder stone.

and bladder, with alkaline concretions and stone formation, through kidney lavage, bladder drainage, ingestion of large quantities of water, acid-producing diet, completely eliminated stones without kidney operation. Had the nuclei been more resistant and had the stones not been of the soft, phosphatic type, this could not have been done. (See Fig. 2.)

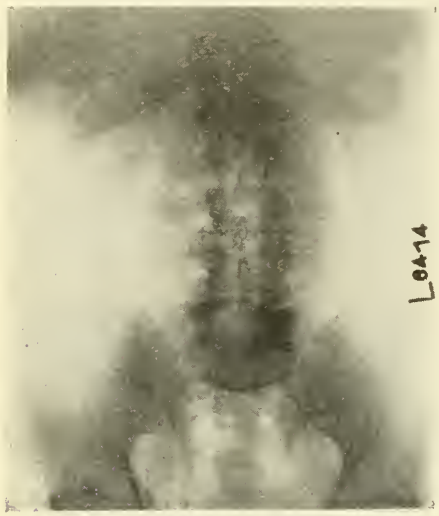


Fig. 3. Case 6. Very large biliary stone. Stone in right lower ureter.

Case 6.—J. H. Q. Age 60. Comes because of a number of severe attacks of pain in right side, shooting towards bladder. Lately quite marked. The interesting thing about this case is, first, the *x*-ray findings showed both kidneys clearly outlined, and of normal size and position. A large circular shadow 6.5 cm. in diameter with calcium deposit on edges in region of gallbladder. A small shadow 8 mm. long in region of right uretero-vesical junction. A re-ray with ureter catheter in position, shows the catheter in contact with calculus at the ureteral opening, with obstruction. The cystoscopy shows a swollen ureteral mouth, with obstruction to the catheter. (See Fig. 3.)

In this case the large gallbladder stone did not cause the symptoms, but the small calculus impacted in the lower ureter; this was treated conservatively through the cystoscope.

Case 7.—F. E. P. Age 52, married. Referred for operation because of recurrent appendicitis, having had four colic attacks the previous week. Has had no illness, except hemorrhoids operated five years ago, and causing no trouble at present. The urine showed some pus and a few red blood cells. The description of the attack made one suspicious of the urinary tract. X-ray showed the right kidney enlarged; the left kidney normal. A suspicious shadow, 4x7 mm. in size, in the region of the right uretero-vesical junction. This was also treated conservatively through the cystoscope, with dilatation by means of several catheters. (See Fig. 4.)

Case 8.—T. N. Age 26. History of typhoid nine years before. Because of several cases of ruptured appendix in the family, the patient became alarmed, thinking he might have appendicitis. Urine showed pus cells 2 plus. *X*-ray showed a small suspicious shadow, lying just above the region of the right uretero-vesical junction, 3x8 mm. in size. Through the cystoscope, a catheter was placed in the ureter, and showed the same shadow, approximately 2 cm. high, in contact with catheter.

Dilatation of the ureter caused this stone to pass several days later.

Case 9.—B. E. Age 36. Referred for probable appendicitis. Examination showed a leukocyte count of 20,300. The urine showed only occasional pus cells, but was otherwise negative. However, the nature of the pain and the tenderness, which was more marked in the left kidney region, with some tenderness along the right ureter, made one suspicious of kidney involvement, and the case was studied further. *X*-ray showed both kidneys normal size and position. On right side, apparently in course of ureter, at level of transverse process of fourth lumbar vertebra, is seen an opaque shadow about 1 cm. in diameter. Somewhat irregular density. At this time no stone was observed in the left side. Tenderness was more marked in the left kidney. The urine still showed but few pus cells and an occasional red blood cell. The catheterized urine gave a growth of pure culture of staphylococcus. Cystoscopy showed a general cystitis, with the right ureter obstructed six inches from the meatus; left one four inches from the meatus. Further study showed that a stone also existed on the left side.

In other words, this patient had a chronic pyelitis, with stone impacted in each ureter. Repeated catheterization



Fig. 4. Case 7. Stone impacted in right lower ureter.

and dilatation of the ureters, done over a period of two months, did not cause the stone on the right side to move at all, and the one on the left side merely moved up and down, and because of the danger of complete obstruction, it was decided to remove these stones by open operation; through an incision along the right rectus border, the right stone was removed extraperitoneally. It was impacted in the ureter, so that it had to be pried out, even after it was exposed. Then the appendix was removed, which showed chronic disease. Eleven days later a left extraperitoneal

ureterotomy was done, and the left stone removed. There was a decided stricture below the stone. Patient made a prompt and good recovery. (See Fig. 5.)

Case 10.—W. J. Age 25, single. Referred with a history of left renal colic. At home physician took an *x*-ray which showed shadow suspicious of calculus in the left kidney pelvis, and wanted a left pyelotomy done for the removal of the stone. A re-ray a few days later showed no stone in the left kidney, but a stone that was in the left lower ureter. There was complete blocking of this ureter, with intense pain because of back pressure. Two catheters were put in the ureter past the stone and left in for twenty-four hours. This was repeated several times during several weeks following, and the patient passed the stone spontaneously. (See Fig. 6.)

This case illustrates the importance of rechecking all cases immediately before operation, because these stones move, and a pyelotomy would have been futile with a stone that was impacted in the lower ureter.

Case 11.—Mrs. W. B. J. Age 31, married. Comes because of pelvic condition. Pelvic backache more on right side, radiating to right inguinal region, with nausea and sometimes vomiting. Burning sensation with spells of urine frequency. Six weeks ago attack simulating appendicitis.

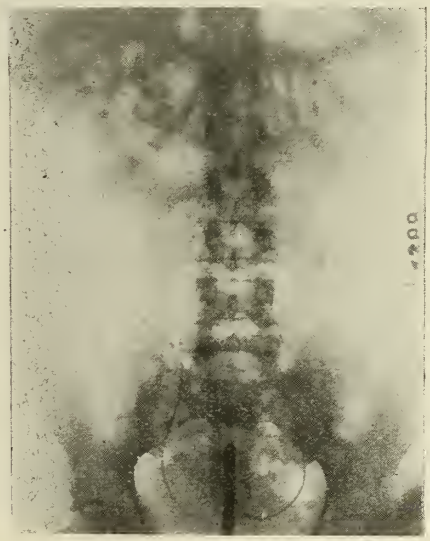


Fig. 5. Case 9. Stone in each ureter.

She had a moderate perineal relaxation; cervix showed chronic ulceration with considerable leukorrhea. The right adnexa and appendix were very tender; the right kidney was palpable. Profuse menstruation. Operation was advised, and a month later the endocervix was excised, a plastic done on cervix and perineum, resection of cystic right ovary was done, left salpingo-oöphorectomy, Crossen-Gilliam shortening of uterine round ligaments, and appendectomy. The day before leaving the hospital, ten days later, she had a colic, suspicious of renal colic, so that an *x*-ray was taken, which showed a small calculus about 1 cm. in size lying in the bladder. This was passed shortly after.

In this patient there was definite disease of the genital organs, and in addition a calculus existed in the right ureter.



Fig. 6. Case 10. Stone in lower ureter. Contrast fluid in bladder neck.

Case 12.—E. M. Age 17, single. Comes with pain in the abdominal inguinal region, suspicious of appendicitis. Urine shows occasional pus and red blood cells. *X*-ray shows kidneys normal in size and position, and irregular calcified area 2x10 mm. in diameter, lying in the lower right ureter.

Dilatation of the ureter with catheters caused this stone to be passed spontaneously, illustrating the type of case that simulates appendicitis, but in reality is due to kidney stone.

Case 13.—H. R. Age 35. Has repeated attacks of abdominal pain simulating appendicitis. He has dental abscesses. An *x*-ray showed a small circular density about 7 mm. in diameter lying just above level of right ureterovesical junction. Cystoscopy and repeated dilatation with catheters did not allow the stone to pass, so that it was removed by open operation, doing an extraperitoneal ureterotomy.

Case 14.—Mrs. W. M. Age 62, married. Referred because of acute abdominal pain in right inguinal region. Appendicitis suspected. The urine shows some pus cells and a few red blood cells; leukocyte count 13,000. Tenderness on kidney percussion. From the type of symptoms, calculus is suspected. An *x*-ray, after careful routine preparation, shows no sign of calcification, in spite of symptoms. The patient improved under a mild urinary antiseptic and the drinking of plenty of water. She had several attacks of similar pain during the following six months, when she spontaneously passed several uric acid stones. These were checked up under the fluoroscope, and cast absolutely no shadow.

In this case the clinical history and urinary findings pointed to calculus in spite of negative *x*-ray findings.

Case 15.—Miss M. D. Age 25. Comes with symptoms of abdominal pain simulating kidney colic, which continued in spite of an appendectomy done several years before. Cystoscopy and pyelogram showed kidneys normal in size and position, no calcification in urinary tract. The right ureter, at the level of the fifth lumbar vertebra, is drawn almost to median line and anteriorly, producing a kink; at this point the ureter catheter was obstructed.



Fig. 7. Case 16. Kink in each ureter.

In this case we had pelvic adhesions, pulling the peritoneum with its attached ureter to the mid-line, causing a kink. Laparotomy to release adhesions cured this patient.

Case 16.—E. M. Age 30, single. Gives a history of abdominal operations for appendicitis, peritoneal adhesions, retroverted uterus and more adhesions, done at various times, and yet she has spells of typical Dietl's crisis; and pyelogram shows both kidneys ptosed. Lower pole of right kidney opposite fourth lumbar interspace; left opposite third. Right kidney pelvis and calyces normally filled; slight kink at junction of kidney pelvis and ureter; right angled turn of ureter at pelvic junction. The left kidney pelvis normally filled; definite kink at junction of ureter and kidney pelvis. This ray was taken with the head of the table lowered. This patient had an occasional colic on the right side, but they were most frequent and more marked on the left side. (See Fig. 7.)

Illustrates a typical case of Dietl's crisis, due to kinked ureter.

Case 17.—Miss L. A. C. Age 29. Has pain in back, radiating down right leg, of sudden onset. Has had several spells of this kind since she was in an automobile accident two years before. She was operated in another city three weeks ago, where a right cystic ovary and the right tube were removed; her appendix had been removed several years before. These symptoms were suspicious of kidney colic, and a pyelogram made at this time showed the left kidney and ureter negative. Right kidney ptosed; shows an acute V-shaped kink of ureter one inch below its junction with renal pelvis, the apex of kink pointing outward and slightly backward; slight dilatation of ureter; catheter meets a stricture lower down the ureter. (See Fig. 8.)

Under diet and treatment with abdominal supporter, this patient improved and had no further colic; moderate discomfort after physical exertion.

Case 18.—Mrs. E. F. L. Age 28. Symptoms of cystitis, which did not improve under treatment, and spells of sharper pain over course of several years. Examination showed a tender left kidney; no urethral caruncle; moderate stricture. Cystoscopy shows bladder o. k., left ureter mouth markedly swollen and red; the catheter was passed easily into the kidney. Pyelogram of left kidney normal size and position; kinking of left ureter at level of transverse process of fourth lumbar vertebra; another less marked kink 7 cm. below this. A catheter was introduced into this ureter, and left in situ for several days.

This was more than two years ago. The patient has remained well since then.

Case 19.—W. Q. Age 34. Comes because of symptoms of abdominal pain. Appendectomy done one and one-half years before. There is some dyspnea; few pus cells and red blood cells in the bladder; *x*-ray shows nothing abnormal. Cystoscopy showed a stricture of the meatus, bladder negative, the right ureter o. k., left ureter mouth appears shallow and relaxed, with stricture at intramural terminal portion, not admitting an F6, but an F5 with difficulty; this was again arrested four inches further. The urine obtained showed pus. A pyelo-ureterogram showed the right ureter and kidney o. k., left ureteral catheter could be introduced only two inches, ureter displaced slightly laterally; no stone. Diagnosis: Stricture of the left ureter.



Fig. 8. Case 17. Kink in right upper ureter.

Under several dilatations and kidney lavage this patient fully recovered.

Case 20.—Mrs. C. I. Age 44. Patient has spells simulating kidney colic. Fifteen years ago was operated for retro-displacement of the uterus. Thirteen years ago a left nephropexy was done; a year ago the left kidney was removed. She still has symptoms referable to the right kidney. Cystoscopy and ureteral catheterization shows an obstruction or stricture in the right lower ureter, with mild pyelitis and dilatation of the kidney pelvis. Pyelogram of the left ureter filled up to the region of the kidney pelvis, the kidney having been previously removed. The right ureter showed a definite dilatation about 1.5 cm., at level of the transverse process of fifth lumbar vertebra, extending upward for 5 or 6 cm., with poorly filled kidney pelvis. Repeated dilatation of the stricture with kidney lavage improved this condition.

The patient states that she did not know what the pathology of the removed kidney was.

Case 21.—T. W. McM. Age 61. Five months ago appendectomy. Comes now because of pain in right inguinal abdominal region, radiating down to thigh, and backache. Epididymis on the right side was removed five months ago; thought to be tuberculous: postoperative pneumonia; was catheterized—developed cystitis with pyuria; spells of irritable bladder. Urine now has 4 plus pus and some red blood cells. Cystoscopy shows a moderate enlargement of lateral lobes of prostate, mild general cystitis, no ulcerations; right ureter shows a stricture, does not admit even a whalebone filiform; left shows a slight stricture but F5

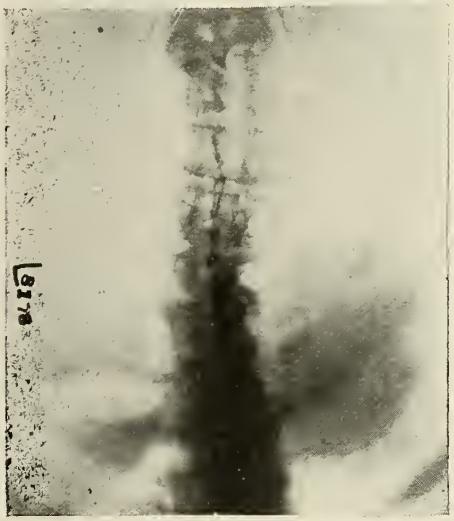


Fig. 9. Case 21. Spondylitis.

catheter was passed as far as the kidney. *X*-ray shows a spondylitis deformans, with curvature of the spine at the twelfth dorsal and first lumbar vertebra, right side. Diagnosis: Chronic spondylitis deformans, subacute general cystitis, stricture of left ureter, stricture lower end of right ureter. The patient was put on medical treatment, and advised to have further cystoscopic treatment with ureteral dilatation. (See Fig. 9.)

This case illustrates, besides the presence of ureter strictures, the importance of the spondylitis deformans in causing some of the symptoms.

Case 22.—L. M. Age 24. Referred because of a cystitis and left pulmonary tuberculosis. Examination shows patient in poor health; hemoglobin 76 per cent, w.b.c. 13,600, pus cells 4 in urine, no reds, tender left kidney. *X*-ray shows this kidney to be twice normal size, no evidence of opaque shadows. Cystoscopy shows moderate congestion of bladder, bladder wall bleeds easily on touching; has a superficially ulcerated appearance, no definite tubercles noted. The catheterized urine, however, showed tubercle bacilli, and a diagnosis of tuberculosis was made. Nephrectomy was done on the left side. The symptoms of cystitis were due to the tuberculosis, and while he has a moderate



Fig. 10. Case 24. Large calcareous shadow in bladder region.

lung infection, the important trouble was the left kidney tuberculosis. This kidney was completely destroyed, containing many pockets filled with pus, and very little functioning tissue.

This case shows the importance of always suspecting tuberculosis in intractable cystitis.

Case 23.—C. M. V. Age 64. States that he had severe pain in right abdomen after lifting heavy weight. Examination showed tenderness in right lumbar region, especially at transverse processes; also in lower abdomen and groin, near attachment of iliopsoas muscle; w.b.c. 9,900; history of having blood in urine at times; patient feared he had appendicitis. An *x*-ray showed no evidence of urinary calculi; moderate osteoarthritis of lumbar spine, some changes in the left hip joint, with ankylosis. Because of the hematuria, the patient was cystoscoped and the kidneys catheterized, which showed blood coming from the right side. Pyelogram showed the ureter and kidney pelvis well filled with 15 per cent sodium bromide solution. Kidney normal in size, outline definitely irregular and somewhat moth-eaten in appearance. Ureteral course slightly tortuous.

Under local treatment this patient improved. What was thought primarily to be an appendicitis proved to be a spondylitis with right kidney infection.

Case 24.—Mrs. M. A. Age 77, widow. Patient had diabetes for years, which improved under treatment, but kept recurring, as the patient backslided on her diet. She comes because she has had nocturnal pain, which resembled renal colic, pain in left flank, radiating into abdomen and bladder; some dysuria and frequency; morphia or codein relieves. She also gives history of recurrent attacks of sciatica on the left side. The urine appeared negative; roentgenograms of the kidney and spine were made, the plates showing what seemed to be a large bladder stone. It was suggested that this be removed by lithotrite. A few days later, under epidural anesthesia, cystoscopy showed no stone in the bladder. A re-ray with cystogram showed this



Fig. 11. Case 24. Calcareous uterus, outside of bladder.

shadow to be posterior and above the bladder and ureters; bimanual examination showed a nodular uterine hardness. It was suspected that this shadow was caused by a calcareous uterine body, and because of great discomfort from pains requiring morphine for relief, it was decided to do a hysterectomy; this was done under sacral anesthesia, with suprapubic infiltration, and about 20 c.c. of ether for inhalation. The uterus had a body size 4x3 inches, with hard calcareous nodules, size 4 cm. in diameter. (See Figs. 10 and 11.)

The interesting aspect of this case is that what was thought to be bladder stone, with symptoms of bladder irritation, proved to be a calcareous uterine body, causing pelvic pressure.

Case 25.—E. B. Age 30. Comes with history of backache for three or four years, repeated attacks of sore throat, slight fever, the urine contained few pus cells. Attacks made one think of kidney stone, because of the colicky nature. An *x*-ray showed what appeared to be a calculus in the left ureter opposite the fourth lumbar vertebra, and in order to identify this, cystoscopy was done, showing quite an obstruction several inches up left ureter. Stereo *x*-ray showed in one plate that this obstruction was exactly at the tip of the ureter; with a history of renal colic and evidence of slight infection in the kidney, one would conclude that this patient had a ureteral stone, obstructing at this point. However, when the picture was put in the stereo, it showed that this shadow was at a level posterior to the ureter. In examining the patient's back, it was found that he had a pigmented wart on his back, which was causing the shadow. (See Fig. 12.)

This case illustrates the importance of stripping the patient completely; also of making stereograms rather than a flat plate. How chagrined we would have been if we had cut down to remove a stone from the ureter, when the patient's trouble was a mild chronic pyelitis, due to a dental infection, and the shadow was really on his back.



Fig. 12. Case 25. Pigmented mole on back (left ureter region).

CONCLUSION

The general surgeon should have a working knowledge of urologic conditions, as to structure and function. He should be personally qualified to make the necessary examinations and tests, or co-operate with those who are. With the aid of the internist, laboratory specialist and roentgenologist, he should get all the available data of the patient as a whole, as well as the local findings.

Finally, the mere technical operator must know biology and physiology and their relation to the disease at hand before conclusions are drawn and a plan of attack is formulated. This will give the clue and indication as to whether or not to operate, what to operate, when to operate, and include a well-rounded after-care and treatment of local and general conditions.

I wish to acknowledge the very good co-operation of Doctor A. J. Wentworth, the roentgenologist, and of my other colleagues in the Mankato Clinic, in the examination, diagnosis and guidance of these cases.

AN UNUSUAL CAUDA EQUINA LESION*

REPORT OF CASE

JOEL C. HULTKRANS, M.D.
St. Paul

This case is reported because of its interest and because Lipiodol was used and found to be of value. It demonstrates one type of *x*-ray picture seen with the use of iodized oil as an aid in localizing subarachnoid block. In the discussion Dr. Ahrens presents a case in which Lipiodol was used, showing a different type of picture.

The patient is a male, aged 32, single, a shoe repairer.

His family history, as far as could be ascertained, was entirely negative. He came to America from Greece in 1910, and has not as yet mastered the English language very well. He has never been sick up to the onset of the present illness.

When first seen on December 1, 1925, he was in bed, complaining of weakness in the legs, loss of energy, and said that he had syphilis. He was seen at his home and no satisfactory history was obtained except the fact that he said he had syphilis and had been treated for about five years for this and was getting worse. Because of this history and because the neurological findings could be explained on a syphilitic basis he was sent to the hospital for a spinal puncture and further study.

The fluid obtained from the puncture was yellow and contained no red blood cells although the benzidine test for blood was strongly positive. The Nonne was 3 +; cell count 1184/3; the gold solution 0001112333; Wassermann negative; coagulation occurred on standing.

This fluid made us feel that we were probably not dealing with lues, and the following morning an effort was made to get a better history, and the following is what was obtained from several sources: In 1920 he consulted a physician because of a rash on his face. This was treated as a simple skin condition. While he was treating for this he said he had a chancre. From his poor description and its rapid response to simple antiseptic treatment, it is not very likely that this could have been a hard sore. He was given a few neosalvarsan injections intravenously at this time, and states that the doctor told him that he did not have syphilis but to satisfy him he was giving him a few "shots in the arm." At the end of this course blood was taken for examination and this he was told came back 4 + positive. Treatment was then started again and kept up from three to four months, when another blood was taken which was said to be 3 +. He was treated then continuously until a year ago when he quit of his own accord. All this time he had absolutely no symptoms except the rash on his face, which cleared up and then came back again, and again disappeared. There were numerous blood Wassermanns taken but none of these were positive except the two mentioned above. He continued feeling well until three months ago, when he consulted a physician because of headache and loss of energy. He was sent to the hospital for a week and his headaches improved, but when he got home they returned again, and he was then sent to another hospital. Here spinal fluid examination was done and he was given a neosalvarsan intravenously followed by spinal drainage. Following this he developed a very severe nephritis and was transferred to the medical service, where he remained for one month for treatment of his nephritis. During this transfer it seems that his name was not obtained accurately and only the cell count and character of the fluid was recorded, and this was much as we found it. It was about the middle of October, 1925, when he first began to notice numbness in his toes, and this had progressed up as high as his knees by the middle of November, when he left this hospital. Shortly after he got home he could not walk as well, his legs were stiff and weak, and about a week before we saw him he began having discomfort in his bladder region.

General physical examination showed nothing of importance. Upon neurological examination the pupils and all cranial nerves were normal. There was an absence of the ankle jerks, and the right knee jerk was possibly a little greater than the left. There was a small area on the back of each calf extending down over the heel that showed a diminished response to all types of stimuli. There was extreme pain over the sciatic upon pressure and on putting the nerve on the stretch. There was a subjective numbness below the knees. There was a weakness of the flexors of the knees and ankles and a questionable diminution in position sense of the great toes. A pain and a feeling of full bladder were present even when it was empty. Bowels moved only with an enema.

All these symptoms progressed so that within a week after he entered the hospital, although he said he felt better, he had a complete retention, and was unable to stand on his feet at all. On December 8, a week after admission to the hospital a spinal puncture was repeated, and preparations were made for a combined lumbar and cisternal puncture. Lumbar puncture was done between the second and third lumbar vertebræ because of pain at the site of the previous puncture, which had been done between the third and fourth. This revealed a pressure of 280 mm. at the beginning, which rose to 320 with jugular pressure. Five c.c. of yellowish fluid were removed, and the pressure fell to 30 and again went to 100 with jugular pressure. The fluid showed a gelatinous web on standing; a 2 + Nonne; 488/3 cells which, when stained, were mostly lymphocytes, some pmn's and considerable debris; Wassermann and colloidal gold were negative. Because no block could be demonstrated above the puncture point, cisternal puncture was not done. One and a half c.c. of Lipiodol was injected through the needle between the second and third lumbar vertebræ.

Because of the progression of symptoms—paralysis of the bladder and legs, loss of ankle jerks, pains like those of sciatica and crural neuritis, the analgesia over the back of the calf—and from the pictures, the diagnosis of caudal tumor was made, and operation in the region of the second and third lumbar vertebræ advised.

*Read before the Minnesota Neurological Society, St. Paul, February 2, 1926.

The patient was operated upon December 16 by Dr. Robert Earl, and the following is the report of what he found at operation: "At operation performed a laminectomy, removing the spine and the lamina of the first, second, third and fourth lumbar vertebræ. Found a dense fibrous tissue adherent to the dura and the anterior surface of the lamina of the third lumbar vertebra. There was a bony exostosis on the anterior surface of the lamina of the fourth lumbar, which made pressure on the cord. On opening the dura the arachnoid bulged through the dural opening, and when the pia was opened a considerable amount of straw-colored fluid escaped. The cord was of a darker color at the point under the third lumbar lamina where the adherent fibrous tissue had been situated. The spinal fluid coagulated and became gelatinous on exposure to air. I lifted the cord and examined the anterior surface with negative findings. The dura was opened the full length of the first four lumbar vertebræ, and a groove director its full length was passed up and down from the upper and lower end of the dural incision. No obstruction was met with."

The patient made an uneventful surgical recovery, the wound healing by first intent, and since the operation he has regained complete control of his bowels and bladder, and is walking about seventy-five steps a day. The subjective numbness complained of is now more of a hyperesthesia, and the trophic disturbances seen along the sides of his feet have entirely disappeared. His ankle jerks are still absent.

I thought it would be of interest to the Society to present at this time some of the impressions from the literature on iodized oil. Lipiodol was introduced in Paris for therapeutic use in 1912, and in 1921 Siccard and Forestier introduced it as an aid in diagnosing sub-arachnoid block by showing it to be opaque to the *x*-ray and non-irritating to the meninges. Since this time it has gained a wide use, and especially as an aid in localizing spinal cord tumors. It is a 10 per cent iodized poppy seed oil. In France they use a preparation called Lipiodol put out by LaFay, and in Germany one called Iodipin put out by Merck.

Ayer and Mixter[1] report irritative effects on meninges of animals reaching its height in twenty-four to forty-eight hours following injection, with cell counts of 1,000 and moderate increase in protein content. These reactions subsided gradually in ten days and fluids returned to normal. It was also noted by Mixter at operation on two patients twenty-four and forty-eight hours after injection that the meninges were somewhat thickened and reddened and the fluid was turbid. One French author also mentions this (DeMartel). Mixter states that all his patients (12) had moderate headache, backache, and temperature, disappearing in a few hours or days, and in one case an increase of paralysis. Laplane, an associate of Siccard, has collected 300 cases from French literature and reports no fatalities. He says that injection is usually painless, although there may be root pain in the vicinity of the tumor, and mentions this as a diagnostic sign, and further states that the reaction of the spinal fluid is mild. Ebaugh of Denver in the American Journal of Medical Science for June, 1925, reports three cases in which Lipiodol was used without reactions. Peiper in the Deutsche Medizinische Wochenschrift of January 1, 1926, states that irritation from the injection occurs in 50 per cent of the cases and lasts for about five days. This consists of pains within the spine, temperature elevation, and headache. No deaths followed. He cites a case where a boy died fourteen days after injection, but a postmortem showed miliary tuberculosis. The meningeal irritation with increase in cell count disappeared within two weeks. He quotes from the literature: One investigator found a facial paralysis that recovered. Another found a disturbance of respiration and slight deliriousness after the oil had settled around a tumor of the cervical cord. One patient suffered from a severe neuralgia of the caudal roots. There was no late damage noted after five years. He states that



Fig. 1. Shows the normal arrest of the oil in the cul-de-sac in a case where there was no obstructon.

[1] Archives of Neurology. Vol. 14, p. 35 (July, 1925).

Nonne proved that Iodipin in average doses does not produce any histological damage to the cord. He mentions a subjective supersensitiveness in some cases, especially in goiter patients. In the January, 1926, issue of the Annals of Surgery, Sharpe and Peterson of New York report less favorably. They believe that Lipiodol is not absorbed but becomes encysted, and report three cases, the first where the oil aided in localizing a block at the lower level of the seventh dorsal. This patient was operated upon twice and although he recovered from the operations his neurological symptoms were progressive. The second operation revealed the oil encysted at the level of the lesion. A year later the patient's condition was worse, and *x*-ray disclosed one round globule of Lipiodol at the level of the eighth dorsal. They express their surprise and disappointment in finding a globule of oil one year after its injection, and especially that his condition had become worse following its use, localizing at the site of the encysted oil in the dorsal area. In a second case a block was localized at the tenth dorsal region and two days of increased pain in the lumbar area and in both legs followed the injection. Spinal fusion operation was successful, and the patient gradually improved. Fifteen months later oil was found in the cul-de-sac. Injection in a third case showed no block but caused severe pains in the lower lumbar area and down the left leg. Sixteen months later oil was found in the cul-de-sac, and the Trendelenburg position for one hour caused no alteration in its position. He thinks this means that oil is encysted in the cul-de-sac, and expresses in his conclusion a word of caution, especially in using the oil as an early routine confirmatory method of diagnosis. In this connection Ayer and Mixter's experimentation on cats is interesting. They injected a small quantity of mercury into the subarachnoid space and found in some cases that in order to change its position the cat had to be shaken quite vigorously, much as one would shake a clinical thermometer.

As to its value and accuracy, all users seem to be of the opinion that it is of value, but all also seem to agree that it is only an aid in diagnosis, and that clinical information is more reliable than the oil. There are several cases reported where the *x*-ray has shown an arrest of the oil, and operation revealed no tumor. Probably a more accurate knowledge of *x*-ray interpretation will reduce the failures and increase the value of the oil. Probably the two most important points in the interpretation of the *x*-ray are, first, a persistent stop, and, second, the character of distribution and shape of the opacity. Several pictures must be taken. Peiper states that the disseminated and drop-like arrest of the oil is suspicious of an adhesive process. He further classifies the finding in spinal cord tumors: (1) a permanent stop of the oil on the upper tumor pole; (2) a greater part of the oil stays on the upper tumor pole and the rest descends and surrounds the flanks of the tumor; and (3) the oil stays as in type 1 and 2 and twenty-four hours later most of the oil is in the cul-de-sac. By this classification he claims to be able to differentiate in some cases extra- from intra-medullary tumors, and in some cases determines operability of the tumor. For intra-medullary tumors he makes the point that free passage of oil does not exclude a small intramedullary tumor. However, complete passage of the oil is extremely rare in the presence of a tumor, and he does not believe that an operation should be done unless the myelogram is positive. There are other men who feel they can differentiate be-

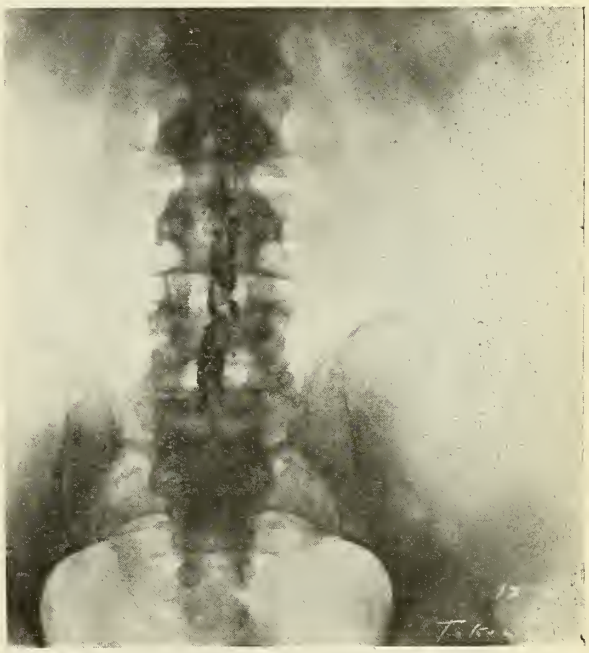


Fig. 2. Permanent disseminated drop-like arrests which are suspicious of adhesive processes, and the greater bulk of the oil at the site where pressure on the cord was found at operation in the case reported.

tween false and true arrest of the oil by the shape and distribution of the silhouette and in many cases can determine the type of the block and its operability. I believe most users feel that best results are obtained by injecting the oil through a cysternal puncture, for, even before sufficient time has elapsed to allow the oil to become encysted, it does not always flow from the cul-de-sac with change of position of the patient.

Summary: There is some irritation from the oil in at least some cases. It is probably unabsorbable and may become encysted. It goes without saying that if there is no block there is nothing to stop the oil, and it is of no value. It is of value as an aid in localizing subarachnoid obstruction when the history and the neurological findings are not sufficient to justify a diagnosis, and this value lies chiefly in its accuracy of localization, which minimizes the extent of the operation.

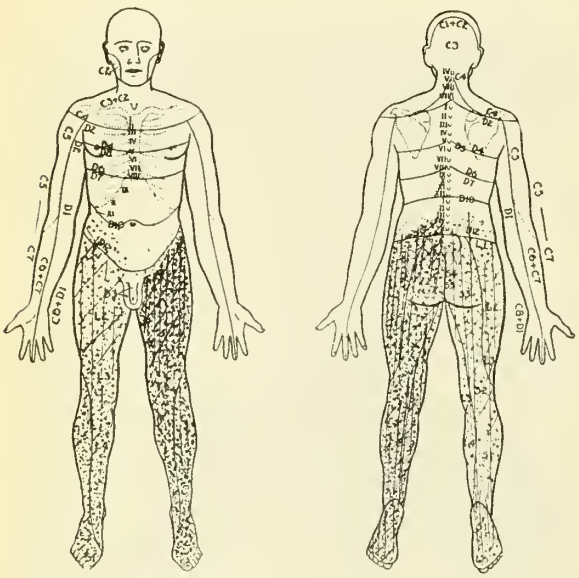


Fig. 1. Degree and distribution of superficial sensory loss indicated by shaded area.

DISCUSSION

Dr. R. S. Ahrens (Minneapolis): I have used Lipiodol by the lumbar route several times with little or no success in localizing an obstruction. I doubt whether it is of any value used this way unless the patient is completely inverted and kept so for a period of time, which is impractical except, as in the case reported by Dr. Hultkrans, where the obstruction is below the lumbar puncture point.

By the cistern route, however, the oil is of value, as has been demonstrated by many observers. At the present time we have a case under observation at the Minneapolis General Hospital, which I hope will give further proof of the localizing value of this procedure, and which I shall report fully at a later date.

This patient is a female thirty-nine years old. She was admitted to the hospital because of a fractured left femur and transferred to the neurological service because of spastic paralysis of the lower extremities.

The history of the onset and development of this condition is as follows: Five and one-half years ago the patient began to have pain in her knees. Three months later a weakness of both legs developed. Nine months later there was a marked numbness in her right foot and at about the same time some difficulty in controlling her bladder and bowels. The numbness was then felt in the left foot and slowly progressed up both extremities until at about the end of two years both sides were involved. The motor



Fig. 2. Oil shows total block at level of third cervical vertebra.

weakness also progressed steadily until at the end of the first year the patient was unable to move her legs. This paralysis was of a spastic type. There was occasional radiation of pain in the lower extremities and some pain in the chest and between the shoulder blades, which were spoken of as occurring in attacks. The left side has always been more involved than the right. The patient managed to get about with the aid of braces for both legs, but there was no marked improvement in sensory or motor disturbance. The sphincter control returned, but has been periodically weak. There has never been any involvement of the arms and her history otherwise is entirely negative.

Her first examination showed the pupils to be normal and the cranial nerves uninvolved. The reflexes in the upper extremities were normal. The knee jerks, right and left, were plus three on a scale of four. The ankle jerks were plus four, right and left, with clonus. Babinski,

Chaddock and Oppenheim gave brisk dorsal flexion on both sides. Her sensory findings were as indicated in the chart (Fig. 1). There was definite impairment to all forms of superficial sensation over both lower extremities, but definitely more marked on the left than on the right. Also on the left there was a definite segmental level (first lumbar) which was constant day by day, whereas on the right no definite level could be established.

Spinal fluid examination was made. The fluid was clear, colorless, and did not coagulate. The initial pressure (direct reading type of manometer) was 100 millimeters with respiratory oscillations of one-half a cm. and with cardiac oscillations very slight. There was no response to jugular compression. Cough and inspiratory response was normal. Movement of the head caused a corresponding change in the pressure reading but after the removal of 5 c.c. of fluid this caused no change.

After several days an attempt was made to do a combined puncture but because of complaint of severe pain in the shoulder and neck the cistern puncture was abandoned and Lipiodol was injected by the lumbar route. *X*-rays following this with the patient lying with hips elevated showed the oil at about the level of the upper lumbar vertebræ. We did not feel that the pictures were at all conclusive. There was no reaction following the injection of the oil and the sensory findings remained the same.

About a week later cistern puncture was again attempted, this time without difficulty, and 2 c.c. of Lipiodol injected by this route. An *x*-ray was taken with the patient in the sitting position about one-half hour after the injection (Fig. 2). You will notice that the oil has stopped at the level of the third dorsal and also that the lower surface of the oil has a definite convexity which appears to conform to the curved outline of a tumor mass. The following day the patient complained of pain in her chest and between her shoulders. Sensory examination showed a definite level to pain, touch and temperature over the right and left sides but more marked on the left, at the segmental level of the third dorsal segment. *X*-ray showed the oil at the same point and no change in outline.

At about this time the patient developed diphtheria. Upon her return from the contagious ward the sensory findings had receded to the same picture as when she was admitted.

Operation will be performed as soon as the patient is sufficiently recovered from her infection. Until then nothing definite can be said as to the nature of the obstruction. If, however, it proves to be a tumor, this case will serve as an excellent example of the value of cisternal administration of Lipiodol in the localization of tumors. Certainly the sensory findings in this case give no clue as to the location of the obstruction and there is nothing to indicate cord involvement about the level of the lower dorsal or upper lumbar segments.

Injection of oil at the lumbar level gave no conclusive picture. Cisternal administration of oil showed total block at the level of the third cervical vertebra and following this the sensory findings changed to correspond to this same level.

THE OCCURRENCE OF FROIN SYNDROME IN DIVERSIFIED SPINAL LESIONS*

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The syndrome of xanthochromia and massive coagulation consists of a spinal fluid which is yellow in color, varying from a pale straw to a light amber, and tending to coagulate spontaneously upon standing. It contains a moderate number of cells, mostly lymphocytes. The fluid drips from the lumbar puncture needle sometimes normally, and sometimes with an apparent increase in viscosity. If allowed to stand in a test tube for a variable length of time it solidifies so the tube may be inverted without spilling its contents. This phenomenon, together with the yellow coloration of the fluid, is known as the "Syndrome of Xanthochromia with Massive Coagulation," or the "Nonne-Froin Syndrome."

This was first found in 1903 by Froin[1] in three cases of spinal disease. According to Mix,[2] who reviews the literature, the first case probably was a pachymeningomyelitis of the conus terminalis, the second a complication of multiple tuberculous foci of the bones, and the third was found in a case which ran the typical course of a Landry's ascending paralysis. A curious fact is that, while the presence of a Froin syndrome always makes one suspicious of a cord tumor, none of Froin's original three cases were tumors.

After Froin's report, several other authors reported finding of xanthochromic fluid in cases which appeared to be meningitic in character. In fact, Sicard and Descomps,[3] in 1908, even went so far as to say that the syndrome always meant meningitis, and never a tumor. However, Blanchetiere and Lejonne[4] found the same type of fluid, but without cell increase, in an intramedullary tumor of the spinal cord, and again in 1914 demonstrated a case of xanthochromia occurring in a sarcoma of the spinal dura in the dorsal region.

A few years later, Nonne[5] described a phenomenon which has come to be known as the Nonne syndrome. This consists in a marked increase in globulin (Nonne phase ii) with no cell increase or color change in spinal fluids drawn from cases of

*Read before the Ramsey County Medical Society, St. Paul, May 25, 1925.

cord tumor. Haines[6] believes that this is merely an early stage of the Froin syndrome.

All yellow spinal fluid does not coagulate and show an increased cell count; therefore, all yellow spinal fluid does not necessarily form what is known as the Froin syndrome. Its occurrence is not dependent upon any one pathologic state but is the result of the operation of factors common to many. Scully[7] has found yellow spinal fluid in many conditions, chief among which may be mentioned hemorrhage, lumbar puncture, tumors of the central nervous system or meninges, tuberculosis of the spine, hemorrhagic pachymeningitis and leptomeningitis, tuberculosis and cerebro-spinal meningitis, luetic myelitis and meningo-myelitis, poliomyelitis, transverse myelitis, cerebro-spinal syphilis, lethargic encephalitis, cardiac decompensation, pneumonia, appendicitis, and malaria. However, the true Froin syndrome, that is, xanthochromia combined with massive coagulation, is found in only a comparatively few conditions, such as tumors, tuberculosis, syphilis, certain forms of meningitis, and Landry's paralysis. It has also been found in several cases of anterior poliomyelitis. Scully[7] concludes that xanthochromia without massive coagulation indicates meningeal inflammation, or hemorrhage into the spinal fluid, while xanthochromia with massive coagulation indicates meningeal adhesions or compression of the cord by a tumor.

Mestrezat[8] in 1912 concluded that xanthochromia accompanied by massive coagulation should be distinguished from erythrochromia due to hemorrhage, although he ascribed them both to a common cause, *i.e.*, hemoglobin in the spinal fluid. Erythrochromia may accompany hemorrhage any place in the sub-arachnoid space, but xanthochromia, according to Mestrezat, was observed only in cases where the lumbar cul-de-sac was shut off from the rest of the sub-arachnoid space by a tumor or other space-constricting agent, and the fluid allowed to stagnate there. Haines[6] makes several differential points between xanthochromia and simple erythrochromia, saying that erythrochromia may be distinguished from xanthochromia by the fact that the former is a hemorrhagic pigmentation and is reddish or reddish brown, and shows a variety of color changes on successive days. Also, there is an erythrocytosis in the fluid of varying degree with an accompanying leucocytosis due to meningeal irritation by the red blood cells. On the other hand, xanthochromatic fluids have a high fibrin content and coagulate massively. Both erythrochromatic and xanthochromatic fluids contain a large amount of protein, but this is constant in the latter, while it decreases in the former.

Much has been written concerning the occurrence and recognition of xanthochromia with massive coagulation, and just as much has been written about its cause. Haines states that "any pathologic alteration of the vertebræ, dura mater, or arachnoid which leads to partial or complete obliteration of the sub-arachnoid space and the formation of a cul-de-sac, is capable of producing the syndrome of xanthochromia with excessive protein and massive coagulation." Mestrezat[8] presents two factors which *he* considers essential for the production of the Froin syndrome. They are: first, the formation of a lumbar cul-de-sac which is cut off from communication with fluid in the upper part of the cord, and second, the engorgement of the spinal veins below the level of the block, or an alteration of the vessel walls by the inflammatory process. Leshke[9] is of the opinion that xanthochromia is due to the formation of bilirubin, due to the action of a ferment which is produced by the disintegrating red blood cells, this ferment acting upon the membranes of the cord. He demonstrates the bilirubin by the Diazo reaction in yellow spinal fluids. Xanthochromia, therefore, can occur in any case in which red blood cells find their way into the spinal fluid. It does not follow, however, that massive coagulation will be a concomitant phenomenon. According to Leshke, the true Froin syndrome is found in only about one-sixth of the cases of xanthochromia, and is associated with a narrowing process in the spinal canal.

Nammack[10] reported ninety-six cases of xanthochromia, only six of which showed the complete Froin syndrome. Two of these six were meningeal hemorrhages, two, tuberculous meningitis, and the other two were poliomyelitis. In an examination of 5,801 spinal fluids, xanthochromia occurred in 1.6 per cent. Sixty-six and two-thirds per cent of the cases of tuberculous meningitis showed xanthochromia, but most of these showed no massive coagulation. Nammack concludes: (1) That yellow spinal fluid occurs in a wide range of diseases of the spinal cord; (2) the complete syndrome of Froin is comparatively rare in its occurrence; (3) in acute or sub-acute conditions the presence of yellow fluid strongly suggests the probable diagnosis of tuberculous meningitis or poliomyelitis.

Mix[7] states that xanthochromia occurs in three types of cases: (1) Acute cases, probably all meningitic; (2) cases of paraplegia, either spastic or flaccid and due to a pachymeningomyelitis of the lower part of the cord, probably the conus terminalis, and (3) tumors of the cord or its coverings. Ayer,[11] injecting blackened paraffine into the dorsal epidural space of cats and experimentally producing symptoms of cord compression and then examining the cords post-mortem, showed the cord to be swollen, the vessels congested and enlarged, and a mild polymorphonuclear cellular infiltration, with considerable serum and some free blood at the site of the compression. Fluids which clot and contain the greater amounts of protein are found in the cases showing the most marked pressure symptoms. He concluded that spinal fluids coming from below the areas of compression usually show marked increase in protein content, at times are yellow, and clot spontaneously. Furthermore, he believed that fluids obtained from the sub-arachnoid space above the level of compression were normal. Later, however, Cushing and Ayer report five cases in which xanthochromia with massive coagulation was present in the spinal fluid above tumors of the cauda equina. Hammes[13] also reports one case of this latter type.

Cushing and Ayer differ in their individual opinions as to the actual cause of the Froin syndrome. The former believes that the phenomenon is produced by a transudation into the fluid from the tumor itself, and that all tumors which are subarachnoid and are bathed by cerebro-spinal fluid are accompanied by some degree of xanthochromia. Ayer, on the other hand, ascribes the changes in the fluid to the transudation from engorged veins in the spinal canal. It would seem to the writer that, in view of the variety of conditions other than tumors in which the Froin syndrome is found, the theory relative to the vascular origin of xanthochromia and massive coagulation is found the more tenable. Both Cushing and Ayer now agree that the fluid trapped below a tumor is the same as that above, only more concentrated and stagnant, while that above the tumor is dilute and circulating. They believe this to be the reason why the fluid below a tumor is more yellow and clots faster than that above it. Appreciation is hereby extended to Dr. E. M. Hammes for the opportunity of presenting the following cases:

Case 1 is a typical example of a spinal cord tumor presenting a complete Nonne-Froin syndrome below the site of the tumor:

Mrs. X, referred to Dr. Hammes by Dr. J. A. Lepak, was a white married female, 35 years of age. She was first seen by us on July 30, 1924. Her family history was negative. Five years before coming under our observation, she had had a tumor removed from her right side. The exact nature of this tumor is not known, but it probably was either a lipoma or a fibroma. In the winter of 1921 the patient fell on the ice quite hard and injured her coccyx. There had been some pain in this region ever since. Sometime in December, 1923, the patient began to have numbness and burning in both feet. She stated that it felt as if she had chilblains. These paresthesias continued intermittently,

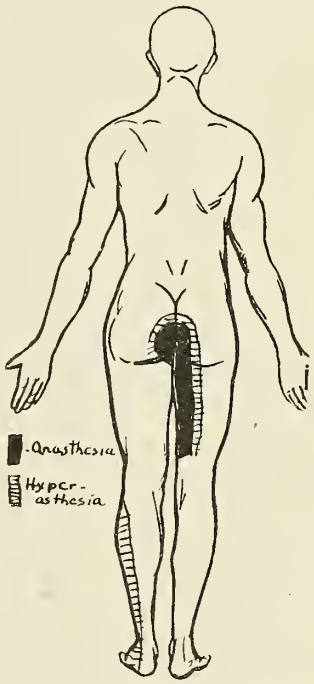


Fig. 1. Areas of sensory disturbance in Case 1. Black area represents anesthesia, and shaded areas hyperesthesia.

and a little later she began to have pain in the lower lumbar region, associated with a "full" feeling in the perineum. Later she developed what she described as a "grabbing pain" in both legs, extending down the calves and into the ankles. These pains were not steady, but were worse on motion. In the latter part of June, 1924, the patient began to notice that she dragged her left foot. She then gradually became weak in both lower extremities, and experienced considerable difficulty in walking. About one month later she developed overflow incontinence of urine and the pains in her legs became more severe. She became bdridden, could not walk, and had to be catheterized daily. Her bowels moved only with the aid of enemata.

Neurological examination at that time showed the pupils and cranial nerves to be normal. The upper extremities were negative throughout. Abdominal reflexes were nor-

mal. There was a flaccid paresis of both lower extremities. Patellar tendon reflexes were decreased and the Achilles jerks were absent. There was no ankle clonus or Babinski. Sensation was normal throughout except for an area of impaired tactile, pain, and temperature sense around the anus and over a small band down the posterior surface of the right thigh to within three inches above the knee. Just outside the zone of anesthesia was an hyperesthetic band. There was an hyperesthetic area along the outer surface of the left leg from about the middle to below the foot. Deep muscle sense was normal.

The spinal fluid was under increased pressure, rapidly dropping to normal. It was yellowish and formed a yellow coagulum on standing. There were four cells per cubic millimeter, Wassermann was negative, globulin four plus, and the colloidal gold curve read 0123344310. A diagnosis of spinal cord tumor at the level of the fifth lumbar segment was made, and the patient was operated on by Dr. A. R. Colvin on August 7, 1924. At operation a glioma of the conus medullaris was found. Because of its infiltrating nature it could not be removed, and the patient died a few weeks later from metastatic gliomas of the brain.

Case 2 is an example of a spinal cord tumor presenting a complete Nonne-Froin syndrome above the level of the tumor. This case has already been reported by Dr. Hammes, so only a brief summary of the salient points will be given here.

A. B., referred by Dr. Lerche of St. Paul, was a white male, sixty years of age. His past and personal histories were negative. In about August, 1921, he began to have pain and soreness on the inner side of the right thigh. This continued for about six months and then rapidly grew worse. About January, 1922, this pain was severe and throbbing in character, and was worse when the patient was lying down. This continued until July, 1922, when it improved somewhat. However, he still continued to have neuralgic attacks along the course of the right anterior crural nerve, and said at that time that he felt a slight indefinite numbness along the outer surface of the left thigh. The neurological examination was essentially as follows: There were definite trigger areas along the course of the right anterior crural nerve; left anterior crural nerve; to the right and left of the second, third, and fourth lumbar vertebræ; and on the sole of the right foot. The left pupil was very slightly irregular. There was some rigidity of the erector spinæ muscles. Bladder and sexual functions were normal. Lumbar puncture between the second and third lumbar vertebræ yielded 20 c.c. of golden yellow spinal fluid under normal pressure. In ten minutes the fluid solidified in the tube. There was an excess of globulin, and six cells per cubic millimeter of fluid. (The count was unsatisfactory because of the coagulum.) Wassermann was negative, and the colloidal gold curve read 0012332110. About February 7 the patient developed marked edema of both ankles, especially the right, accompanied by profuse localized sweating. The right patellar and Achilles jerks were sluggish, and there was indefinite impairment of pain and tactile sense over the left gluteal region. The right thigh was three centimeters smaller than the left at the same level. In the absence of cord symptoms a diagnosis of tumor of the cauda equina was made and the patient operated by Dr. Lerche on April 16. At operation yellow spinal fluid was found above and below a tumor of the cauda equina. The tumor was removed, and examination made by Dr. E. T. Bell of the University of Minnesota revealed it to be a hard fibroma. The patient ran an uneventful convalescence and three months later was able to return to work.

Case 3 is illustrative of what probably was a diffuse syphilitic lesion of the central nervous system, probably a loculated meningitis, although, as will be seen, both the blood and spinal fluid gave negative Wassermann reactions.

Mr. Y., referred by Dr. Hendrickson of Enderlin, North Dakota, was a white, married male, 53 years of age. Until the onset of his illness he had been engaged as a locomotive engineer. His family and marital history was negative. The past history was essentially negative except that he had had gonorrhea when a young man. In August, 1923,

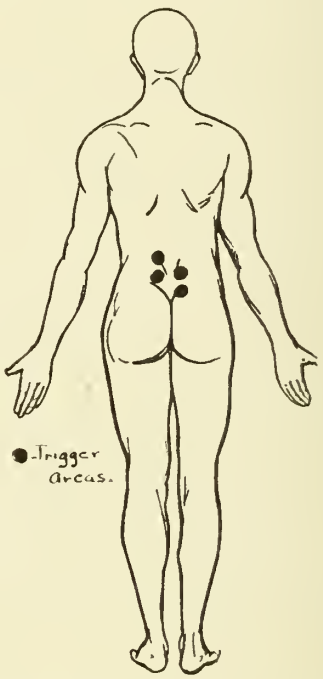


Fig. 2a. Trigger areas in Case 2. Black dots represent points at which pressure would produce painful spasms.

the patient had had an attack of herpes zoster involving the left shoulder and side. He recovered from this in about one month. In the early part of October, while the patient was talking to his wife, she noticed that he seemed to be too tired to talk, and that the left side of his mouth would draw up at times. He seemed to be confused and acted as if he had been drinking. He staggered some while walking. This soon cleared up, however, and the patient was well again until the latter part of October, when, after he had finished his run and was eating in a lunchroom at two o'clock in the morning, he suddenly noticed a marked weakness of his left leg and arm. He was unable to walk unassisted, and was taken to his hotel, where he undressed himself and went to bed. There was no headache, vertigo, vomiting or visual disturbance. The next morning the pa-

tient got up and hobbled around unaided. Blood pressure at that time was 132-80. That evening he went to bed, where he remained for a few days. On the fifth day he walked for a distance of five blocks, but his gait was spastic and his legs felt weak. In December, 1923, he began to have pains in both shoulders, especially the right. This pain did not radiate, but for two weeks was so severe that the patient was unable to raise his right arm. After a few weeks this subsided, but there has been some pain ever since. In February, 1924, the patient's left arm became so weak that he could hardly raise it. This came on in two or three days and finally the arm became useless. About one week later, the right arm acted in a similar manner. There was no disturbance in the legs at this time. In about ten days the arms began to improve and later became useful again, and the patient was able to dress himself, eat, write,

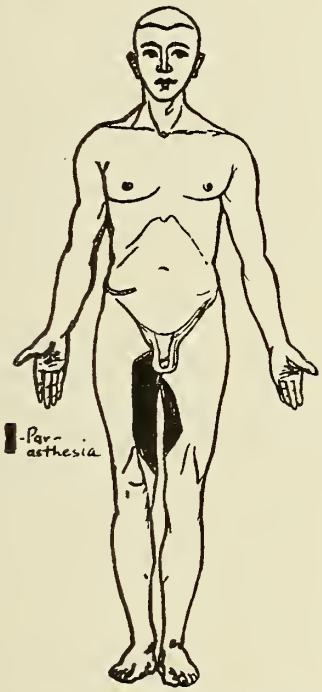


Fig. 2b. Trigger areas in Case 2. Black dots represent points at which pressure would produce painful spasms.

etc. About June 10 the patient began to have difficulty in starting his urine. On June 15 both of his legs became weak and the bladder condition progressed. Patient could not feel bladder distension, and on June 18 he had to be catheterized. He felt weak all over and by June 19 was unable to walk because of a spastic paraplegia of the lower extremities. He stated that his sexual power had been markedly diminished since the fall of 1923. He was seen by us on June 19, 1924, and the neurological examination at that time revealed the patient to be well developed and fairly well nourished. He had a spastic paraparesis of the lower extremities and was unable to void spontaneously, although the bladder was distended to within three fingers of the umbilicus. The pupils were equal and regular and responded promptly to light and accommodation. With the exception of a slight weakness of the left seventh, the cranial nerves were normal. The fundi were normal and there was no nystagmus or alteration in the speech or voice. Both upper extremities had a very slight ataxia which was a little more evident on the left side. There was also a slight tremor of the left hand. The superficial reflexes were absent. The patellar and Achilles tendon reflexes were bilaterally increased, and Babinski's response was obtained on both sides. There was a bilateral ankle clonus which was slightly more pronounced on the left. Tactile, pain, and temperature sense was normal. Spinal puncture between the third and fourth lumbar vertebræ gave a straw-yellow fluid under markedly decreased pressure. Within three minutes it had solidified in the test tube. There were 25 cells per cubic millimeter and a four plus globulin. The colloidal gold curve read 3344444433 and the Wassermann was negative.

The patient was kept in bed on a super-nourishing diet. After a few catheterizations he began to void spontaneously and further catheterization was unnecessary. He was put on alternating injections of 2 grams of sodium iodide and 0.6 grams of neosalvarsan intravenously, one of each being given every week. After the first few injections the patient began to show marked improvement. He gained in weight, the stiffness disappeared from his legs, and he soon was able to walk. By July 17, 1924, he was walking eight or ten blocks a day and had gained about ten pounds in weight. Spinal fluid at that time was under normal pressure, was white, and did not coagulate upon standing. The globulin had decreased to two plus, but there were forty-seven cells. The Wassermann was negative. Because the patient had business interests in California, he was forced to move out there before he was completely well. However, a recent letter from him stated that he is feeling well, and walks with very little trouble. He should, of course, keep up treatment until the spinal fluid becomes normal.

Case 4 is of particular interest because the spinal fluid was examined before the pressure on the cord was sufficient to produce a complete Froin syndrome, and again afterward when a typical Froin syndrome had appeared. The patient was used by the writer for teaching purposes at Ancker Hospital through the courtesy of Drs. Goltz and Whitmore. He was a white, unmarried male, 66 years of age. He stated that for the eight years previous to his admission to the medical service on January 20, 1925, he had been suffering from pain over the lower lumbar and sacral areas. The pain was dull and steady in character and was increased by walking or standing. At times this pain radiated into the right groin. A little later the patient began to experience difficulty in voiding. There was some decrease in the size of the urinary stream, and also some burning and frequency. There was no hematuria. Upon admission he was unable to void more than a small amount at a time, although the bladder was distended to half way between the pubis and the umbilicus. The past history was negative from a neurological standpoint except for the fact that the patient had had "sciatica" forty years ago, at which time he was unable to walk for fifteen months. He denied gonorrhea, syphilis, and alcoholism.

On January 29 the urological consultant, Dr. Foley, detected no evidence of prostatic enlargement and concluded from his examination that the patient probably had a cord

bladder, due to some lesion of the spinal cord or cauda equina. At this time the urine contained two plus albumin with a few granular casts and an occasional epithelial cell. His hemoglobin was 60 per cent, red blood cells 4,460,000, and leucocytes 15,500. X-rays of the spine showed a suggestive lesion in the lumbar area with erosion of the intervertebral cartilage. On January 30, the neurological examination was negative throughout. Spinal puncture was performed at the usual site and 10 c.c. of fluid was removed under decreased pressure. The fluid was pale yellow and perfectly clear, and a pellicle or web appeared in it almost immediately. Examination revealed it to contain two plus

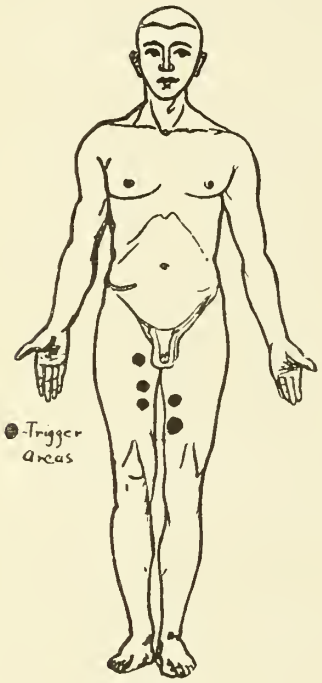


Fig. 3. Areas of paresthesia in Case 4. Black areas represent paresthetic zones.

globulin and 837 cells. The Wassermann was negative and the colloidal gold test was not performed because there was an insufficient quantity of fluid. This yellow type of fluid with pellicle formation is strongly suggestive of tuberculous involvement of the central nervous system, but the patient presented absolutely no clinical neurological evidence of such a disease. On January 31, he was apparently semi-comatose and sleeping a greater part of the time. He was being treated urologically for the bladder condition. His temperature varied between 99 and 101. On February 2, he complained of pain in the lower lumbar region and on the inner surface of his thighs. He said that it felt as if sandpaper were being pressed against his skin. On February 6 he developed a pneumonic process in both lungs and his temperature dropped to subnormal. On February 7, eight days after the first lumbar puncture, another spinal puncture was done, and yielded about 2 c.c. of fluid under very much decreased pressure. It took about one-half hour for the fluid to run out. The fluid was golden yellow in color and coagulated spontaneously. Because of the coagulum only two drops of the fluid could be examined and it contained many red blood cells and one polymorphonuclear leucocyte. Neurological examination was negative except for the lower extremities, which showed absent Achilles jerks and decreased muscle power on both sides. There was impairment of sensation to light touch over a ribbon-like area extending upward from the right outer malleolus for about five inches. All other forms of sensation were normal. The patient ran a variable course from this point on, the pneumonic process continued, and he died on March 5, 1925. Post-mortem examination of the spinal canal revealed a collection of pus extra-durally in the region of the lumbar vertebræ. This collection communicated directly with a large abscess in the surrounding muscle tissue. Dr. John Noble, pathologist at Ancker Hospital, who performed the autopsy, stated that in his opinion the pus originated from the lumbar vertebræ in this region and that it was of a specific tuberculous nature which had become secondarily infected. The anatomical diagnosis was questionable lumbar Pott's disease and extra-dural abscess with spinal cord pressure. When the first puncture was done, the patient evidently had enough cord pressure to give bladder symptoms and sensory disturbances, but not enough to produce a Froin syndrome in the spinal fluid. At the time of the second lumbar puncture eight days later, the pressure was sufficiently marked and prolonged to produce a typical syndrome of xanthochromia with massive coagulation.

SUMMARY

1. The syndrome of xanthochromia and massive coagulation, or the Froin syndrome, consists of a yellow spinal fluid which coagulates spontaneously upon standing.

2. It usually indicates compression of the spinal cord.

3. It may be found either above or below the compressing lesion.

4. The Froin syndrome has been experimentally produced in animals by artificially compressing the cord with sub-dural injections of paraffine.

5. It probably is due to the transudation of substances into the fluid from engorged veins in the spinal canal.

6. The writer has observed the syndrome of xanthochromia and massive coagulation (a) above and below tumors of the spinal cord, (b) in diffuse syphilitic lesions of the central nervous system, and (c) in a case of cord compression by an extra-dural abscess.

REFERENCES

1. Froin, G.: Gaz. d. hop. 76:1005, 1903. Quoted by Cushing and Ayer.
2. Mix, C. L.: Surg. Clin. of John B. Murphy, 4:317, 1915.
3. Sicard and Descomps: Gaz. d. hop. Oct. 20, 1918. Quoted by Mix.

4. Blanchetierre and Lejonne: Gaz. d. hop. Paris, 82:1303, 1909. Quoted by Cushing and Ayer.
5. Nonne: Deutsch Ztschr. f. Nervenh., 40:161, 1910.
6. Hanes, F. M.: Am. Jour. Med. Sci., 152:66, 1916.
7. Scully, F. J.: Arch. Neurol. and Psychiat., 10:83, July, 1923.
8. Mestrazat, W.: Le liquide chephalo-racidien, normal et pathologique, Paris, 1912. Quoted by Clarke.
9. Leshke: Deut. med. Wchnschr., Berlin, April 7, 1921.
10. Nammack, C. H.: Am. Jour. Med. Sci.., April, 1920, 540-541.
11. Ayer, J. A.: Arch. Neurol. and Psychiat., 2:158-164, August, 1919.
12. Cushing, H., and Ayer, J. A.: Arch. Neurol. and Psychiat., 10:167, August, 1923.
13. Hammes, E. M.: Arch. Neurol. and Psychiat., 2:82. January, 1924.

DISCUSSION

Dr. C. R. Ball: I have listened with much interest to Dr. Kamman's most excellent paper on this subject. The Froin syndrome became of general interest a few years ago when it was thought that it had a very valuable diagnostic significance in distinguishing between an extra-medullary and intra-medullary tumor of the spinal cord. Since then a number of conditions other than extra-medullary spinal cord tumors, or spinal block, have presented this syndrome. It is still, however, a very interesting phenomenon and has a certain valuable differential diagnostic significance when construed together with other symptoms in helping to distinguish between these two cord conditions. More recently other means of distinguishing spinal block have been discovered—notably by the introduction of a preparation of iodized oil, and other fluids similar in character, directly into the spinal canal, and after it has had time to gravitate up or down, as the case may be, the taking of an *x*-ray picture reveals whether the spinal canal is open or not. The injection of air may be also used for this purpose, taking a roentgenogram afterwards. With the Froin syndrome and these still newer methods of diagnosing spinal block our determination of this condition has been rendered quite definite and positive.

Dr. J. C. Hultkrans: As a matter of interest in this connection I wish to mention a case of tetanus in which massive coagulation of the spinal fluid occurred. This case presented the typical tetanus picture. A lumbar puncture was done but no fluid was obtained, although no difficulty was experienced in giving antitoxin, and after the antitoxin had been given it could be made to run out of the needle by lowering the apparatus. This was considered sufficient evidence that we were in the sub-arachnoid space. Two days later, on repeating the treatment, about 2 c.c. of a semi-gelatinous yellow-tinged fluid was obtained which solidified on standing in the laboratory. This patient improved rapidly and no further treatments or punctures were given. This is another case that emphasizes a point made by Dr. Kamman that this phenomenon is not pathognomonic of any particular condition, but probably indicates a stasis of spinal fluid.

Dr. Kamman (closing): I am glad that Dr. Ball mentioned the injection of iodized oil into the spinal sub-arachnoid space and the making of a roentgenogram to determine the presence and location of spinal block, because it brings to our attention a valuable diagnostic aid. However, I do not feel that it ever will supplant a consideration of the Froin syndrome, because the latter when found in the routine examination of the spinal fluid will indicate a sometimes entirely unsuspected block or tumor and lead to further study of the sub-arachnoid space. Of course, when our technic reaches that stage of perfection where the sub-arachnoid space can be photographed, the studies on the Froin syndrome will become relatively less important.

I was intensely interested in Dr. Hultkrans' mention of finding xanthochromia with massive coagulation in his case of tetanus. In my review of the literature I did not find any reference to such findings in that disease, and I believe that Dr. Hultkrans' report is altogether unique.

The Division of Communicable Diseases of the New York State Department of Health has just issued a statement calling attention to forty-eight deaths from diphtheria which occurred during the months of January and February in the State outside of New York City. Forty-four of these 48 deaths were of children.

In the light of modern knowledge a fatality from diphtheria is considered by the Health Department as a needless sacrifice of human life, and every such death is investigated to determine where the responsibility rests. In only six cases was a physician summoned on the first day of illness. There is probably no infectious disease where prompt treatment is so necessary as in diphtheria. Medical research has demonstrated conclusively that if antitoxin is properly administered in sufficient dosage on the first day of illness to a patient suffering with diphtheria, death from the disease almost never occurs. Therefore, there were forty-two deaths in which the parents (or the patients themselves) were partly to blame in that they neglected to call a physician promptly.

On the other hand, in three instances a definite responsibility rests upon the attending physician for failure to give antitoxin, while in ten other cases there was a delay on the part of the physician in administering this remedy. —*Health News Service.*

PULMONARY EMBOLISM*

S. F. Herrmann, M.D.
Welcome, Minn.

Whenever the tragic accident of massive pulmonary embolism occurs it arouses widespread interest. It is rare, yet almost every layman can tell of the case of some friend who following an operation, or some serious illness, was reported as recovering nicely, when suddenly he raised up in bed, gasped for breath, and dropped back dead. A large thrombus from some known or hidden location had entered the blood stream and blocked the pulmonary aorta, or one of its major branches. Published reports deal mainly with this fatal form of postoperative embolism.

Wharton and Pierson[1] in 1922 reported eleven cases of embolism following 1,600 gynecological operations at Johns Hopkins Hospital, an incidence of .68 per cent. Two of their cases were of the classic massive type, and nine were cases of minor infarction. Emphasizing the importance of the minor forms of embolism, they conclude that embolism is the cause of fully 50 per cent of pulmonary complications following gynecological and abdominal operations.

Heard[2] in 1924 reviewed the incidence of postoperative pulmonary embolism at the Mayo Clinic. From 1912 to 1920, in 125,164 operations there occurred 104 cases of gross pulmonary embolism, not including infarcts, an incidence of .08 per cent. Previously, Wilson,[3] from the same clinic, had reported thirty-six fatal cases in 57,000 operations from 1899 to 1912, a percentage incidence of .063.

Lindsay[4] in 1925 reports an incidence of .3 per cent in the London Hospital from 1919 to 1924, there being ninety-six cases in 31,426 operations. He quotes Rupp's figures, gathered in Berlin, giving the percentage incidence of .26 during the period of 1903 to 1920 in 22,689 operations. Rupp also computed the percentage mortality in internal diseases for the same period. In 13,000 autopsies, pulmonary embolism was the cause of death in 1.1 per cent.

These are figures from large institutions emphasizing the importance of embolism as a fatal complication, but to the average practitioner they may perhaps be less impressive than my own less pretentious experience. In the last four years, in general practice, I have encountered seven cases of pulmonary embolism. The condition is certainly much more common than is ordinarily recognized. A discussion of the chief clinical features of my own cases may be of interest.

Pulmonary embolism may complicate heart disease, particularly malignant endocarditis, or mitral stenosis with mural thrombosis in the dilated right heart chambers. It has been known to follow the administration of quinidin in cases of auricular fibrillation, when the return to normal auricular contraction led to the separation of large thrombi from the auricular appendages. The more common cause, however, is thrombosis in some systemic vein following operation, childbirth, or some infectious disease like typhoid fever or pneumonia. Prolonged recumbency and sepsis are important factors, as is also the age of the patient, since thrombosis is more prone to occur in patients past middle age who often exhibit circulatory stasis. The most frequent sites of the thrombosis are the deep pelvic or femoral veins, but the clot may arise in any vein. Magnus,[5] in twenty-four autopsies, found the thrombosis in the deep pelvic veins or vena cava seven times, right femoral 7, left femoral 6, spermatic 2, and multiple sites 2. In Hampton and Wharton's gynecologic cases[6] 41 per cent were associated with femoral thrombophlebitis.

The pathology in the lung depends largely on the size of the embolus, and on whether or not it is septic. A large thrombus blocking the bifurcation of the pulmonary trunk, or the entire right or left pulmonary artery, will cause sudden collapse from circulatory failure before much change has been produced in the lung. There is experimental evidence that from 52 to 66 per cent of the pulmonary circulation in animals may be shut off before any appreciable effect on the general circulation ensues. Just a little more obstruction, however, leads to sudden circulatory collapse.[7]

Smaller emboli, obstructing some branch of the pulmonary artery, will lead to hemorrhagic infarction. An infarct is typically pyramidal, the base at the periphery of the lung, with overlying pleurisy, and sometimes slight effusion. If the embolus be septic, abscess or gangrene of the infarct may result. These infarcts occur much more frequently in the lower lobes, and more often on the right side. Karsner and Ash[8] were able to produce real infarcts only in the presence of passive congestion. In nor-

*Read before the Blue Earth Valley Medical Society, Fairmont, Minn., May 28, 1925.

mal lungs small emboli caused an incomplete transient infarction only if they lodged near the angular lung edge; otherwise they did no damage. Virchow[9] was able to produce infarctions without the presence of passive congestion, but he used infective emboli.

There is no doubt that small emboli often pass unrecognized. It is probable that they may even be symptomless. This is suggested by Mann's observations[10] on experimental pulmonary embolism in dogs. He found it impossible to produce death or seriously imperil the life of the dog by repeated emboli, until the pulmonary circulation was greatly obstructed. Some emboli passed from the femoral vein to a branch of the pulmonary artery without producing any effect on either blood-pressure or heart-beat. Usually, however, there was a slight drop in blood pressure at the instant the embolus passed the heart.

Symptoms will vary with the extent of pulmonary pathology and therefore depend particularly on the size of the embolus. The varied symptomatology will be best brought out by discussion of individual cases.

Case 1.—Massive, fatal embolism. Mrs. O. M., aged 34, called me three weeks after the birth of her second baby because of pain and swelling in her right leg. She had noticed some pain in the leg for about ten days, but had paid little attention to it. Examination showed a slight swelling of the right leg and ankle, with moderate tenderness in the popliteal space. The right calf measured 1 cm. larger than the left. Temperature 99°; pulse 128. I diagnosed thrombophlebitis of the right popliteal vein and ordered her to remain in bed with the leg elevated on pillows and wrapped in hot towels. She did not feel sick, and the leg was so comfortable, that one week later, without consulting me, she got up. While walking to the breakfast table she had a sudden attack of vertigo. She sat down, and in a few minutes a second dizzy spell caused her to fall to the floor. I was called immediately, at 9:30 A. M., and found her lying on the couch in a cold sweat, pale but not cyanosed, breathing deeply, and complaining of a tight feeling in the precordium. Temperature 95°; pulse 130; respiration 26. The pulse was soft and easily compressible. She was evidently in shock. Examination of the chest showed nothing of note. The leg appeared normal with neither swelling nor tenderness. An embolus had evidently passed, but as yet had produced no findings in the chest. I ordered her to remain quiet and administered a sedative.

At 5 P. M. I found her feeling much easier. Temperature 98°; pulse 132; respiration 26. There were no abnormal findings except tachycardia and hyperpnea.

On the following morning she looked very ill, with an anxious facies, slight cyanosis of lips and nails, flaring alæ nasi. and an expiratory grunt. She complained of pain in the precordium, radiating through to the right infrascapular region. The pain was aggravated by deep inspiration, and any effort to turn in bed caused a fit of coughing. Temperature 98°; pulse 112; respiration 30. Examination showed no heart murmurs, no dullness in the chest and no abnormal breath sounds, but there was tenderness at a point to the right and above the navel, and below the right scapula (De Mussy's buttons). The liver was palpable three fingers below the costal margin. The costal margins flared equally but every deep breath caused a catching pain. I diagnosed right diaphragmatic pleurisy, caused by an infarct.

This diagnosis was confirmed the next day when she showed a temperature of 101.4°, pulse 137, respiration 36, more definite cyanosis, dullness in the right base posteriorly, with distant breath sounds and no râles.

On the following morning, the third day after the embolism occurred, she presented an unforgettable picture. She showed the most pronounced general cyanosis I have ever seen. Drops of cold sweat stood out on face and extremities. She looked like the corpse of one asphyxiated by drowning; yet she smiled, talked freely, and felt comfortable. There was no more pleural pain, and she was not at all restless. Temperature 97.2°; pulse 130; respiration 34. The radial pulse could barely be detected. Blood pressure was 84/60. The cardiac outline did not seem enlarged. There was no distention of the jugulars. A rough loud systolic murmur was now heard in the mid-precordium. It was not transmitted. The costal margins flared equally. Dullness and absent fremitus persisted over the right base posteriorly, and the breath sounds were distant, but râles could be heard in both bases. Marked abdominal distention was not relieved by an enema.

Evidently circulatory failure was imminent, but it was hard to account for the lack of demonstrable cardiac dilatation. I felt that the appearance of the rough systolic murmur probably indicated the presence of a thrombus in the right ventricle. Digitalin was given hypodermically, and codein by mouth to insure rest.

Conditions on the fourth day were much the same except that the blood pressure was still lower. I could palpate no radial pulse. Temperature 94 (oral); 101.2 (rectal); pulse 136; respiration 40. A definite friction rub could now be heard over the right lower lobe posteriorly, and breath sounds there were more audible. The rough systolic murmur persisted. Cyanosis was extreme. The patient rested quietly all day. In the evening, when she raised up to drink, she suddenly collapsed, and dropped back on the pillow dead. Permission for autopsy was refused, but I felt that the manner of her death confirmed the diagnosis of a thrombus in the right ventricle, which, loosened by the slight effort of drinking, suddenly blocked the pulmonary aorta. The extreme cyanosis in this case was probably due more to the enfeebled circulation than to the infarct.

Case 2.—Repeated emboli causing large infarcts. Mr. F. M., aged 29, on the twenty-fifth day of a mild typhoid fever developed left femoral thrombophlebitis. He was kept recumbent, the left leg elevated on pillows and wrapped in hot moist compresses. He was not very sick. The temperature rarely rose to 99, but the pulse remained definitely dicrotic and averaged about 112 to 114. Blood

pressure 120/70; w.b.c. 15,200; hgb. 70. Ten days after the onset of the phlebitis he experienced a sudden attack of vertigo, followed by much belching. He felt better by the time I arrived, and I could find no unusual signs except an anxious facies, deep breathing, and an increase in the pulse rate to 140. There was no cardiac dilatation, no findings in the chest, and no cough. I prescribed Tr. Digitalis, thinking that the faintness might have been due to myocardial weakness. Thirty-six hours later the temperature had risen to 102; the pulse was still 140. He now complained of sharp, sticking pains in the right hypochondrium, aggravated by deep inspiration. Troublesome belching continued. There were no chest findings, but definite tenderness in the right upper rectus suggested diaphragmatic pleurisy. The diagnosis of infarction of the right lower lobe was confirmed the next day by the appearance of definite dullness in the extreme right base posteriorly, with distant breath sounds there and in the lower right axilla. The pleural pain was subsiding. On the fourth day more evidence appeared in the form of sputum consisting wholly of bright red blood clots. The temperature had dropped to normal, and the pulse to 120. Resonance was returning in the right base, the breath sounds were less distant, and there were no râles. At no time thus far had he shown any cyanosis. The next day, the fifth following the first embolus, and the 30th of his illness, he had another sudden syncopal attack, followed by much belching and a sharp pain in the right axilla, which was worse on inspiration. In a few hours the temperature rose to 101.5, but the pulse remained 112, probably because of the slowing action of digitalis. There was more extensive dullness in the right base, with absent tactile fremitus, and a definite dry friction rub appeared in the axilla. Evidently another embolus had reached the right lower lobe.

The fever gradually dropped again and he became more comfortable, but continued to expectorate blood. On the thirty-fourth day signs of another infarction appeared. The temperature again rose to 103.6 and the pulse to 140. The abdomen became markedly distended, and he now showed moderate cyanosis of lips and nails. In the next two days the patient improved rapidly, temperature and pulse dropped, he felt comfortable, but the cyanosis deepened to an indigo tint. The blood pressure was 140/80, indicating a competent myocardium. No new findings developed in the chest, and the cyanosis gradually cleared.

On the thirty-sixth day, without warning, a sudden stabbing pain was felt in the left chest. In a few hours a loud friction rub developed lateral to and below the left nipple, with some impairment of resonance and of breath sounds. This infarct, however, cleared up in the course of a week. Conditions in the right lower lobe changed slowly. Almost the entire lobe was functionless, as evidenced by a flat percussion note, and absence of breath sounds, voice sounds, and râles. On the forty-second day a few sibilant râles and breath sounds were heard, the sputum was less bloody, and we began to hope that our patient might continue to recover.

This he did, but not without first developing on the forty-third day, a thrombophlebitis in the right femoral vein. Fortunately, however, this second thrombus absorbed without sending any fragments on exploring expeditions into the lungs. We got our patient up into a chair on the fifty-fourth day. An area of dullness persisted for a long time in the extreme right base posteriorly, but after two months this, too, disappeared.

The striking feature of both cases was the very marked cyanosis. It is interesting to inquire into the possible meaning of this symptom. In Case 1 it influenced us to give a bad prognosis, but in Case 2 conditions were different. Cyanosis is caused by the presence of venous blood in the arterial system. Failure of sufficient air to reach the alveolar epithelium leads to incomplete oxygenation, and cyanosis results. This condition obtains in pneumonic consolidation, when bronchioles and alveoli are plugged with exudate, so that the blood flowing through the consolidated portion returns to the heart unchanged. If the blood supply to the unaerated portion is also shut off there will be no cyanosis, because the blood perforce follows some other channel to a functioning portion of lung, and therefore returns to the heart as arterial blood. We are assuming, of course, that there is a sufficient area of normal lung to accomplish complete oxygenation. If some blood filters through the consolidated portion it will emerge unchanged, and will therefore color the arterial stream and cause cyanosis. The more blood that passes through, the deeper will be the cyanosis. The deepening cyanosis, therefore, in the case of an infarct, is evidence of recovery, that is, restitution of circulation, and not, as in pneumonic consolidation, of more extensive pathology. Cough and expectoration, along with enzymatic and absorptive processes, gradually clear the bronchioles of the obstructing coagulum. As this is accomplished air can again reach the alveoli. The cyanosis then gradually clears. In other words the process is as follows: In a medium-sized infarction a branch of the pulmonary artery is occluded. This leads to infiltration with blood of the area supplied by the artery. Clotted blood fills both alveoli and bronchioles. By gradual re-establishment of collateral circulation venous blood again begins to flow through the infarcted substance, and, returning to the heart as venous blood, causes cyanosis. Clearing of the alveolar spaces and bronchioles then lightens and removes the cyanotic tint by re-establishing respiration.

Deep cyanosis developing subsequent to a medium-sized infarction does not necessarily indicate a bad prognosis, provided there is no cardiac dilatation, or reflex disturbance of heart action and

marked hypotension, which contributes to the cyanosis. Rather, it indicates a reparative process, and is evidence of recovery.

Case 3.—Postoperative embolism. Mrs. A. N., aged 25, was operated for bilateral pyosalpinx and ovarian cystadenomata, with implantations on the sigmoid and in the posterior cul-de-sac. Both ovaries and tubes were removed. The patient was recovering nicely, with a daily temperature of 99 to 100, when on the seventh day she suddenly sat up in bed, dyspneic, and complained of a sharp pain in the chest. She could not definitely localize the pain. She appeared pale and very anxious, and began to perspire profusely. The pulse was weak and rapid, and the temperature shot up to 103. Examination of the chest showed a questionable slight dullness over the left base posteriorly. She developed a cough, but raised little sputum, which was never bloody. In twenty-four hours she felt much easier. The fever dropped gradually, and she went home on the twenty-second day with no abnormal chest findings. Our diagnosis was that she had had a small embolus from the deep pelvic veins, which never caused a demonstrable infarct, pleurisy, nor hemoptysis.

Case 4.—Postoperative embolism. Mr. H. T., aged 43, was operated under local anesthesia for left inguinal hernia. Following the operation he had a daily, unexplained, afternoon temperature of 99 to 100. Pulse and respirations were normal. On the second day he began to complain of vague abdominal pains. The abdomen remained moderately distended, and repeated enemata gave but little relief. He vomited repeatedly, and refused food. He had daily loose bowel movements. On the sixth and seventh days he felt somewhat easier, but on the eighth day he complained of a sudden sharp stabbing pain in the right paravertebral region, at the level of the eleventh thoracic spine. Temperature 98.3; pulse 90; respiration 26. I was able to find absolutely no physical signs of trouble in the chest, but because of the sudden onset of the pain, and the location in the right base, suspected a small embolus. The persistent abdominal distress and daily slight fever supported the supposition of a hidden thrombophlebitis. On the twelfth day the temperature reached 101.4, pulse 88, respiration 32. Breathing was catchy, with pain on deep inspiration. Definite dullness with distant breath sounds was found in a triangular area at the extreme right base. These developments confirmed the diagnosis of a small infarct in the right base, with an overlying pleurisy to explain the pain.

In three days the temperature, pulse, and respirations had returned to normal, and the patient was discharged feeling well. An impairment of resonance was still demonstrable over the infarct, but breath sounds were becoming audible. Two weeks later the condition had entirely cleared up.

Case 5.—Puerperal embolism. Mrs. R. J., aged 45, in a normal labor gave birth to her sixth child. She had been troubled during all her pregnancies by tortuous varicosities in both legs. Twelve days postpartum she developed a superficial thrombophlebitis on the medial aspect of the right thigh. There was pain, inguinal adenitis, and a red streak running down the thigh, which palpation showed to be a very tender thrombosed vein. Temperature 97; pulse 94. She also had large, protruding, painful thrombotic hemorrhoids. We kept her in bed, the leg elevated and covered with hot compresses. The thrombotic process gradually spread down into the calf, but she was comfortable, and never showed a rise of temperature, until on the seventh day she complained of a sudden sticking pain below the left scapula, and the temperature rose to 99.2, pulse 110, respiration 28. There was impaired resonance below the inferior angle of the left scapula, with distant breath and voice sounds. Evidently a patch of pleurisy was present, but no friction rub could be heard. The temperature became normal the next day. In four days the sticking pain on inspiration had disappeared, and resonance and breath sounds were normal. There was never any cough nor sputum. Fifteen days after the onset of the phlebitis we got her out of bed, and she had no further trouble.

Case 6.—Puerperal embolism. Mrs. M. P., age 30. This case parallels Case 5. Four days after the birth of the second child a superficial phlebitis developed in the right thigh, and soon thereafter in the left leg. On the twentieth day a pain appeared low in the right axilla, to be followed on the twenty-first day by a similar pain below the left scapula, extending around to the precordium, accompanied by belching. Temperature 99.3; pulse 96; respiration 32. No physical signs appeared for two days. Then there was slight dullness and suppression of breath sounds in the base of the left lung. Turning in bed caused a catching pain in the left side, and violent coughing. There was no cyanosis, and no sputum. When the pain first appeared in the chest the patient remarked that the left leg felt better. Within a week temperature and pulse had dropped to normal, and recovery thereafter was uneventful.

Case 7.—Septic emboli in acute endocarditis. Mr. G. J., aged 24, had acute pharyngitis, which led to bacteremia and multiple arthritis. Blood culture showed a streptococcus. Endocarditis and myocarditis came next, to be followed in turn by a septic pneumonia, of sudden onset, which from day to day showed great variation in physical signs. There were several attacks of sudden chest pains, with collapse symptoms, followed later by patches of consolidation, and pink frothy sputum. These attacks I believed to be caused by embolic thrombi from the heart, but the symptoms ascribable to embolism were difficult to evaluate because of the extreme myocardial damage and the pneumonia. In all probability the pneumonia itself was of embolic origin. Death came suddenly on the thirty-first day of the illness. Autopsy showed the presence of large fibrinous thrombi in all the heart chambers, warty vegetations on the aortic valve, a circular infarct in the anterior wall of the right ventricle, and multiple infarcts in both lungs.

Summary: Pulmonary embolism is of not infrequent occurrence. In the presence of known thrombosis, or when an unexplained slight postoperative fever suggests the possibility of hidden thrombosis, the development of embolism should be kept in mind. The distinctive feature in each

of the cases reported, which should suggest the diagnosis of embolism, was the very abrupt onset. Initial symptoms are: sudden anxiety and restlessness, with dyspnea, tachycardia, precordial oppression, persistent belching, and a shock-like state with rapid soft pulse, cold extremities, and profuse perspiration. In the course of several hours there follow pleuritic pain, fever, bloody sputum, and the appearance of a dull area in the chest, especially over the right lower lobe, with distant or absent breath sounds, and often a friction rub. The bronchial breathing and râles of pneumonic consolidation are lacking. Cyanosis is extreme in massive embolism.

BIBLIOGRAPHY

1. Wharton, L. R., and Pierson, J. W.: The minor forms of pulmonary embolism after abdominal operations. Jour. Am. Med. Assn., Dec. 2, 1922, lxxix, 1904.
2. Heard, J. E.: Postoperative pulmonary embolism. New Orleans Med. and Surg. Jour., 1924, lxxvi, 451.
3. Wilson, L. G.: Postoperative pulmonary embolism. Ann. Surg., 1912, lvi, 809.
4. Lindsay, E. C.: Prevention and treatment of postoperative pulmonary embolism. Lancet, Feb. 14, 1925, 327.
5. Magnus, G.: The site of origin of pulmonary emboli, and the significance of the saphenous vein in the process. Klin. Wchnschr., Jan. 22, 1924, iii, 142.
6. Hampton, H. H., and Wharton, L. R.: Venous thrombosis, pulmonary infarction, and embolism following gynecological operations. Bull. Johns Hopkins Hosp., April, 1920, xxxi, 95.
7. Haggart, G. E., and Walker, A. M.: Physiology of pulmonary embolism as disclosed by quantitative occlusion of the pulmonary artery. Arch. Surg., May, 1923, vi, 764.
8. Karsner, H. T., and Ash, J. E.: Experimental bland infarction of the lung. Jour. Med. Research, 1912, xxii, 205.
9. Virchow, R.: Quoted in MacCallum's Textbook of Pathology. W. B. Saunders & Co., 1916, 31.
10. Mann, F. C.: Pulmonary embolism. An experimental study. Jour. Exper. Med., Sept. 1, 1917, xxvi, 387

The Principles of Ethics of the American Medical Association begins with these words, "A profession has for its prime object the service it can render humanity." We have a glorious record of service to humanity in the past. The aspect of our profession, and of civilization in general, has changed more in the past fifty years than in all previous history, and it is necessary that we examine carefully to see whether we have so applied our present knowledge that we may render the greatest possible service. We will have the full confidence and support of the American people when we convince them that we are in earnest about health examinations and health conservation. We can't do this work in an old-fashioned, amateur way. We must form a modern, efficient, broad-gage organization. — E. B. Edie, M.D., *A. M. A. Bulletin.*

CAUSES OF DEATH IN DIABETES MELLITUS*

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In order to compare the causes of death in diabetes before and after the introduction of insulin, we have reviewed and checked the cases in the University Hospital and in private practice since 1916. The records of the Dispensary are not complete during the war period, and for that reason are not included.

We have divided the cases into two groups. The first includes all cases entering the hospital up to March 1, 1923, when the use of Iletin began. The second group includes all cases entering the hospital since Iletin has been used. A few cases did not receive Iletin, but have been reported in order to give a more accurate report over a two-year period. No cases since March 1, 1925, are included.

Beginning in September, 1916, 179 cases in the first group were seen. Of this number, 28 died in the hospital. The mortality varies between 0 and 33 per cent per year. This does not mean that the treatment varied. All cases were under the same regime, that is, the treatment outlined by Joslin. During the last five years the yearly mortality has been nearly stationary. This is interesting when we consider the irregularity with which severe or mild cases, with and without complications, may enter the hospital.

The causes of death in the various years are of interest, and are as follows:

1916: Cardio-vascular disease, one; cerebral hemorrhage, one; acidosis, one.

1917: None died in the hospital.

1918: Tuberculosis, two; septicemia and carbuncle of leg, one each.

1919: Acidosis, four.

1920: Diabetic gangrene, one; acidosis, five; angina, one; following prostatectomy, one.

1921: Acidosis, five; tuberculosis, two; gangrene of leg, one.

1922: Acidosis, four.

Of the cases that died in acidosis during 1920 and 1921, 50 per cent were severe cases of 1918 and 1919 which had been under treatment for one

*From the Metabolic Service of the Medical Department, Medical School, University of Minnesota.

or two years, and had become so severe that they could not be kept sugar-free on various diets; malnutrition developed, and acidosis increased gradually. It would be most interesting to have these cases for treatment today. We all realize that we are not seeing the extreme cases of the earlier periods resulting from prolonged starvation.

In all cases a complete history and physical examination were made and the necessary laboratory work to complete our records was done. Of the 179 cases, a positive Wassermann was unusual, only four receiving luetic treatment. Every case of death from acidosis showed an increased white blood count, from 10,000 to 28,000. Each case autopsied of this number showed bronchopneumonia. The diagnosis of bronchopneumonia was made clinically in many other cases, where autopsies were not performed. Secondary anemia was unusual in the uncomplicated cases. This corresponds closely with the report of Fitz and Murphy from the Peter Bent Brigham Hospital.

Our conclusions, therefore, are that of the twenty-eight cases dying in the hospital, nineteen died of acidosis, three of tuberculosis, two from gangrene of the leg, one of angina, one cardiovascular, one carbuncle, and one with uremia following an operation for prostatectomy. In other words, coma was the greatest cause, and bears out the old statement that acidosis caused about 75 per cent of the deaths before the use of Iletin. The other causes, except tuberculosis, can be included in the general group of cardiovascular diseases. Coma uncomplicated by terminal infection was rare. Secondary anemia was rare. Leukocytosis was generally found in all cases, and syphilitic infection was unusual.

In 1922, because of the interest as to the results after patients left our care, the 179 patients were traced, and the following mortalities are reported:

Years	Mortality Percentage
1916-1923	83
1917-1923	60
1918-1923	66
1919-1923	38
1920-1923	42
1921-1923	30
1922-1923	7

Average mortality, 22 per cent.

This again shows the small value of statistics, for, naturally, with increasing age in the older patients, we could not expect decreasing mortality. We can assume that the 7 per cent mortality of 1922 would have increased rapidly by the time this report was completed if Iletin had not been used. Our yearly statistics from the hospital, therefore, seem to be of more real value in comparing the results before and after the introduction of Iletin.

Since March 1, 1923, 116 new cases of diabetes have been treated in the University Hospital and in private practice. In this series, there have been seven deaths, two from acidosis, one cardiovascular, three following the amputation of gangrenous lower extremities, and one following cholecystectomy. One left the hospital after amputation for gangrene of both legs had been advised. The mortality over this two-year period is approximately 7 per cent. The interesting feature is a contrast between the causes of death in the two groups. Whereas acidosis caused the greatest number of deaths up to 1923, complications such as gangrene or secondary infection cause the greatest number now. Carbuncle does not enter into this small series, and although tuberculosis has been present in about the same proportion of the cases under Iletin treatment, we seem to be showing better results. We realize that the annual mortality in the new series is of little value in drawing conclusions, but certainly we are seeing fewer cases of coma, and more of cardiovascular complications.

In this group of 116 cases, twelve were operative, seven having amputation for arteriosclerotic gangrene, four cholecystitis, one acute appendix, and one squamous carcinoma of the submaxillary gland. A few others had minor operations, such as cataract extractions. A great many others had generalized cardiovascular diseases with arteriosclerosis of various grades, but are placed in the general group, and were treated medically. It seems that we can safely report a lower mortality in the new cases than during the preceding six years. Acidosis as the cause of mortality is rapidly decreasing.

In reviewing the causes of death in this disease, there are many lessons to be learned. In view of the fact that coma seems to be closely associated with infections, it is of the greatest importance that we watch for this possibility in all diabetic individuals. This is especially true of young people, who seem more prone to develop acidosis than the older people. The prevention of coma and acidosis rests primarily upon the doctor's training of his patients in the technic of diets. By careful diet they may more easily keep the urine free from sugar and diacetic acid. Care for the smallest ail-

ment is essential, and symptoms should be reported to the doctor immediately. It is necessary that patients appreciate necessary changes in their diet at this time, and that they rely upon forced fluid and orange juice when anything unusual occurs.

After coma has developed and the physician has been called, the case has become a medical problem. The routine to be carried out is not to be covered in this paper, but complete studies and close observation of the case are necessary. Under Iletin treatment, it is the unusual and severe cases entering the hospital before the physician has an opportunity to institute his treatment that probably will be lost. It is important to remember that during coma the patient usually requires a great deal more Iletin than under normal conditions, and the physician must ignore the amount of glycosuria that may occur temporarily if he can control the acidosis.

Sepsis of various kinds must be watched for carefully, such as acute respiratory diseases, tonsillar, dental, skin, and intestinal infections. Over long periods of time they lower the carbohydrate tolerance. If overwork, worry, and improper exposure to cold and dampness are added, the mortality is greatly increased.

Unfortunately, in older people cardio-renal diseases have to be considered along with arteriosclerotic gangrene and infection. Fortunately, in the elderly patient, acidosis is more slow in developing, and we have a better chance to watch for it. These cases usually become a general medical problem with renal disturbance and myocardial weakness. After gangrene has once occurred, it is a divided responsibility between the surgeon and the physician. Gangrene should rarely occur in the patient under treatment. The preventive treatment as instituted by Joslin should be carried out painstakingly.

In summarizing, we may say that in the past there were four common causes of death: (1) coma, (2) sepsis, (3) pulmonary tuberculosis, (4) gangrene, including cardiovascular diseases. Today we have the order reversed, the greater number of deaths being due to cardio-vascular diseases. As a result, many such cases can be prevented or postponed by the proper education of the patient. It is the unusual case in acidosis that the physician does not see early enough that is lost. The responsibility of the doctor rests in the early detection of typical symptoms and laboratory findings of acidosis.

LEGAL POINTERS

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Malpractice cases divide themselves into three general classes—

1. Those where (the facts being undisputed) the issue is whether or not the physician or surgeon followed the usual and customary practice of physicians and surgeons in good standing in his community in like cases.

2. Those where there is a dispute as to the facts surrounding—

(a) The propriety of the treatment given;

(b) The treatment actually given; in other words, what did the doctor actually do?

(c) The result; in other words, the true "before and after" picture.

3. Those few cases where it is claimed that the doctor guaranteed or contracted to effect a cure or some other result.

The first class deals with the competency of the doctor involved. The "do" or the "don't" lies in his medical knowledge or skill, and for this reason is eliminated from further discussion here. The third is a matter of contract and is likewise not discussed.

The large majority of malpractice cases fall in the second class, and, contrary to the common impression, these cases are nearly always determined in the courts, not from a medical aspect, but upon issues of fact.

To illustrate, the writer recently defended a doctor against alleged malpractice in performing a bone graft on a fractured tibia. The question of the propriety of the operation was involved. The doctor testified, and his history card and the hospital record confirmed his testimony, that the patient told the doctor he had sustained a fracture of the tibia about one year before; malunion had resulted; that the patient's leg began to hurt after walking a block or two, and the more he used it the more it pained, and that he could not work. *X*-rays and physical examination confirmed the previous fracture and malunion. On the stand the plaintiff (his wife and other witnesses corroborating) admitted the fracture the year previous, but stated that he told the doctor that when he got up

in the morning his leg pained but after walking a block or two the pain ceased; that he was capable of performing, and actually did perform, heavy work as a laborer without pain or inconvenience. Defendant readily admitted that if the plaintiff's story was true, he should not have performed the operation; the medical testimony even of plaintiff's own doctors was such that the court charged the jury (on this issue) that if the doctor's statement of what the patient told him was true, it must return a verdict for the doctor on this issue. In other words, the propriety of the operation depended, not on the testimony of doctors, but on the truth or falsity of plaintiff's story on the stand as to what he told the doctor.

This illustrates the point of this article, namely, despite all the medical testimony found in the average malpractice case, the final decision usually rests on a question of fact independent of such medical testimony.

Every doctor knows how a very slight change in facts may completely alter a case from a medical standpoint. But what every doctor does not realize is that protection from malpractice cases rests fully as much in assuring a stable state of facts as in medical competency.

A few general observations may be helpful.

It is axiomatic that an honest mistake of judgment in diagnosing a case is not malpractice; the doctor is not liable for a mere error of judgment provided he does what he thinks is best after a careful examination; but, as stated, the mistake must be one of judgment and not of conditions; of facts, if you will, upon which the judgment is based and which are ascertainable by methods usually employed by competent doctors. What story did the patient tell the doctor? What investigation did the doctor make to ascertain the facts? A slight variance in the facts when recited in the court room may, unless successfully contradicted, result in a verdict against the doctor.

As has been well said by the Supreme Court* of the State of Minnesota—

"The basis of the proof of negligence and of the hypothetical questions to plaintiff's experts is naturally the narrative of the family or friends of the patient. Their testimony must ordinarily be unsatisfactory because of the presence of natural bias, the absence of technical knowledge essential to proper observation, and often the want of opportunity for actual perception, as will presently appear in this case. 'The physician,' said Judge Upton, 'is liable to have his acts misjudged, his motives suspected, and the truth colored or distorted, even where there are no dishonest intentions on the part of his accusers. And from the very nature of his duty, he is liable constantly to be called upon to perform the most critical operations in the presence of persons united in interest and sympathy by the ties of family, where he may be the only witness in his own behalf.'"

All this is particularly true where a doctor on examination finds but slight chance of a complete recovery yet must proceed on the chance that he may be able to accomplish what is, to the doctor at least, the unexpected. The patient must help, of course, so he is cheered up and matters explained in the most hopeful manner. Favorable recovery failing, the result is contrasted with the doctor's hopeful statements. The patient is disappointed and dissatisfied, and begins to work out in his own imagination the reasons for the failure to cure. Imagination assists him in coming to the conclusion that the doctor has not properly treated his case. In time this becomes a conviction on the part of the patient, and the latter, his relatives and friends begin to discuss what the doctor did or did not do, and endeavor to find something to support their conviction, namely, that the doctor was guilty of malpractice. Discussion continues and an attorney is consulted and given the facts which have grown up in the imaginations and minds of the patient, his relatives and friends, and a suit is started. The doctor in the meantime has gone about administering to other patients, this being one of many cases. He has forgotten the details, he has no records, and even if he does happen to remember the details of the case, he has no one to support them, whereas the plaintiff is supported by all those who are peculiarly interested and biased.

Illustrations and arguments might be multiplied, but they would all lead to one conclusion, namely, the doctor must be prepared to defend himself not only as to medical ability, but as to the facts of the case.

How can this be done? The following "do's" and "don'ts" may be helpful:

DO'S

First.—Get the habit of keeping records, and, above all, *complete* records. A poor record is frequently worse than none at all.

Reasons.—Juries give great weight to records;

*Staloch v. Holm, 100 Minn. 276.

they are written as a rule before trouble appears and when there is no motive for misrepresentation.

Adding facts, though true, to a partial record, has all the appearances of adding an afterthought; of bolstering up one's case. Put yourself in the jury's place; such a situation ofttimes is disastrous.

The writer has often thought *where practicable* it might be well to have printed on the history card of the doctor and of the hospital a line, "the above history read to the patient and found correct," followed by a place for the signature of an office assistant, nurse or interne, and to have the history as written down read to the patient, acquiesced in by him, and that fact noted by the signature of such assistant.

"Printed," because then it appears usual; if not printed, if done only occasionally, the fact that it was done in a specific case raises the question "why?" in a jury's mind.

"Re-read," because, unless this is done, the patient can easily say he did not make the statement as written, and, not having seen it or had it read to him, did not know it was incorrectly transcribed.

"Re-read and signed" by an assistant, if practical, so as to provide another witness.

Above all, the records should be complete even to the point of negativing conditions and facts.

Second.—Personally examine hospital histories, charts, reports of operations, etc., and see that any inaccuracies or omissions are immediately corrected or inserted.

Reasons.—The profession would be startled to know how harmful inaccuracies in charts and reports (seemingly unimportant at the time) become in a lawsuit. They not only create a false atmosphere, but strike at the correctness, at the value to be placed on other portions of the chart as evidence.

Third. — Hospital charts and other (including office) records should, where practicable, show names of nurses, internes or assistants in attendance on the cases so as to assist in securing them as witnesses later.

Reasons.—Nurses, internes, assistants frequently move to distant places. In the course of a year or so it may be hard to identify a nurse from her handwriting on a chart. A space for insertion of names in the hospital chart would be helpful.

Fourth.—If a hint of trouble appears, secure and record names of witnesses.

Reasons.—In addition to that given above, let us suppose a patient is in a ward; how helpful it would be to have the names and addresses of other patients in the ward to testify to his complaints, suffering or other conditions!

Fifth.—Use the *x*-ray and save the pictures.

Reasons.—The *x*-ray is a record which, properly explained, is hard to disprove. Its value as evidence lies in its availability; hence it is to be preserved until all danger of litigation is passed.

Sixth.—In cases of serious deformity use a camera before treatment.

Reasons.—The hardest thing for a jury to understand is a bad result. They forget doctors are not insurers; and this is particularly true where the "before" condition is pictured by the plaintiff as being far better than the "after" condition.

How easy to say in the case of a serious deformity you want a picture to study the condition. How helpful when trouble comes to have a picture of the condition of the patient's nose, leg or other deformed member to correctly portray the real condition, and how helpful in convincing the jury of plaintiff's powers of exaggeration.

DON'TS

First.—Don't be too optimistic in the presence of a patient or his relatives or friends; or, if you have to bolster up the patient's courage, be sure to explain privately to his relatives the true situation.

Reasons.—Most people are honest. Misunderstanding frequently starts thoughts, starts discussions that lead to trouble where, but for the misinterpretation placed on one's words or acts, no discussion would have taken place.

Remember that the layman does not stop to realize that a physician or surgeon does not deal with inanimate or insensate matter like a stone mason or bricklayer, who can choose his materials and adjust them according to mathematical lines. Laymen do not realize that the physician has a suffering human being to treat, a nervous system to tranquilize, and an excited will to regulate and control; and that the physician has not only to apply the known facts and theoretical knowledge of his science, but that he may have to contend with powers and hidden influences, such as want of vital force, habit of life, hereditary disease and the mental

state of his patient, all or any of which may render the management of a case difficult, doubtful and dangerous, and may have greater influence in the result than all the physician will be able to accomplish even with the best skill and care.

Second.—Never criticize, even *by inference*, another doctor's work without being absolutely sure you are justified in so doing.

Reasons.—You never can really grow by knocking the other fellow. You may not know all the facts; and, furthermore, the facts told you may not be correct.

The writer realizes the above is very sketchy. "Do's" and "Don'ts" might be multiplied, as might illustrations. The purpose is not to formulate a code, but to draw the thoughts of those interested to what is believed will be to some at least a new side to malpractice litigation. This accomplished, it will pay to give a little thought to one's own particular case, and see if one's "record of the facts" is as complete as one would like.

CRIME, DELINQUENCY, AND DEPENDENCY

"Crime and delinquency are largely mental-hygiene problems and require the attention of the mental clinic just as mental and nervous disorders do. The studies made of juvenile and adult offenders show unmistakably what an excellent opportunity the clinic affords to help unsocial and maladjusted individuals in their mental and social reconstruction. They point, moreover, to the preventive work that would have been possible had the significance of their unsocial tendencies been recognized in early life. The nursery and kindergarten studies show that even very young children develop harmful mental and emotional habits and personality difficulties that have everything to do with the disorders and problems of youth and maturity and must be corrected early to avoid later serious trouble. * * *

"Dependency, too, and other forms of social inadequacy are frequently the result of poor social adjustment, even where there is no clear-cut mental disease or defect or organic deficiency, and the power to adjust satisfactorily to social conditions and to make the most of the opportunities that are available depends on the personality development that takes place during childhood and adolescence. Thirty per cent of the 366 problem children given special study in the public schools of Staten Island showed some maladjustment to social conditions that already was proving detrimental to educational and social efficiency, and many more showed abnormal personality trends."—Report on Mental Health Survey of Staten Island, National Committee of Mental Hygiene.

FULL-TIME CLINICAL TEACHING*

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The functions of a university are usually expressed under the two heads, teaching and research.

Teaching tends to divide itself into that adapted to general education, the undergraduate school, and that adapted to specialization, the graduate school. The Minnesota Medical School is an undergraduate school, but many of the medical school professors are also on the graduate school faculty. This fact needs to be kept in mind when one considers the type of man needed in medical school professorships.

The University tends to develop service enterprises such as dormitories, dining halls, shops and storehouses, university press, athletics, health service, dispensaries and hospitals. These are business undertakings, but justified as adjuncts to teaching and research. This needs to be kept in mind when considering the growth of the University's clinical facilities.

A medical school is not different fundamentally from any other college or school. It differs from others in detail,—just as agriculture differs in detail from mining,—because of the material handled in teaching and research. One part of this material in the case of a medical school is composed of sick human beings. These sick people must have medical care. This fact relates medical teaching to the practice of medicine. It cannot be otherwise—indeed, it ought not to be otherwise,—for the practice of medicine is the goal toward which the student of medicine is directed and for which the medical school in large measure exists.

The relation of the medical school to medical practice is one cause of the great interest manifested by medical practitioners in medical education. This interest is important and should be fostered. To be properly fostered it must be informed.

It should be valuable to all of us occasionally to look at the whole matter in historical perspective.

Medicine began as unrelated empirical facts—trial and error procedures, with a gradual selec-

*Read before the Hennepin County Medical Society, Nov. 2, 1925.

tion of those which proved to be useful. Medicine now has a scientific foundation, but medicine itself is not a science. It is an art based on science. Probably it will always be an art.

Medical teaching began as the handing on of medical knowledge from father to son, from preceptor to pupil. The great master tended to gather many pupils about him, and the school came into existence because of this fact.

At first each teacher taught all that was known, but gradually a differentiation was brought about. Anatomy for a long time tended to go with surgery. The physician, in contrast with the surgeon, was interested in medication, consequently in alchemy and its successor, chemistry, and in hygienic rules, to be based eventually on what we now call physiology. Gradually the basic sciences were evolved and differentiated from the practical procedures now supposedly based upon them, but largely, no doubt, of more ancient empirical origin.

Fifty years ago the prevailing type of medical school in this country was proprietary, that is, owned and conducted by the faculty. The prized chairs in the clinical branches were controlled by successful practitioners. Teaching and practice were carried on together. The scientific branches were usually taught not by professional scientists but by young practitioners, as stepping stones to the practical chairs.

Some called this an advantage; others, a disadvantage. The difference of opinion depended on point of view. Those who looked upon practice as chiefly an art or trade or system of technics would favor the practitioner-teacher. Those who believed that the art should be practiced from a scientific point of view and that progress in the art depended on scientific progress would favor more scientific teaching.

It is apparent that the latter view prevailed. The great progress made in the medical sciences in the last seventy-five years undoubtedly contributed to the now prevailing opinion that the sciences must be taught by men specially prepared in the sciences and not by physicians in practice. It came about therefore that the medical sciences were handed over to professional anatomists, chemists, bacteriologists and so on. These men had prepared themselves for their particular jobs and devoted all their time to them. They were called "full-time" men, meaning that they did not have any outside practice.

By the year 1900 all the medical schools were committed to the idea of full-time scientific departments. While one frequently hears that the teaching in these departments is "too scientific," or "not practical enough," I have never heard it seriously proposed that the professional anatomist be displaced by a practitioner of surgery, nor the physiologist by a man in internal medicine.

The decade from 1910 to 1920 was one of seething change in American medical education. By consolidation and elimination the number of schools was cut in half and practically all the survivors became university departments. All to the extent of their ability built up their science departments. At the same time the realization became increasingly acute that the practical branches could be adequately taught only when the student could be brought into intimate and supervised relation with the patient; and that the student, so far at least as the art is concerned, must "learn by doing." This meant a greater control of clinical material than the previous loose affiliation with private or public hospitals had permitted.

It was recognized that the hospital and dispensary are to the clinician what the laboratory is to the scientific worker. There came a demand for university hospitals, and for such relations with other hospitals as would give the university a free hand for teaching and research.

It is astonishing to what a degree this ideal has in a few years been realized. It is still more astonishing when one considers how intimately these changes are bound up with medical practice, and how ideals and even vested rights of practice have been accommodated to the change of medical education. The comparatively little friction involved in these changes speaks well for the open-mindedness of the medical profession.

All sorts of questions have been raised, such as state medicine, favoritism through university prestige, control of teaching institutions by cliques, etc. The wonder is not that a questioning attitude prevails among medical men, but rather that in such large majority they have been in favor of these progressive measures in medical education.

One further step was bound to be taken. If the anatomist's job is one demanding special prepara-

tion and the devotion of one's full time and energy, why should it be different in a department, let us say, of internal medicine? The amount of teaching is as great. The type of knowledge is as detailed and as important—perhaps more important—to the young practitioner. The needs for progress in knowledge are even more pressing for the sake of humanity. The full-time professor of medicine was envisaged as a university officer on a par with the mathematician, historian, physicist and physiologist.

But here important questions arise and demand an answer. Since medicine is a practical art and since medical men must serve the people in a practical way, is it safe and proper that the teacher of medicine be removed from actual practice? Is there a special psychology of teaching attached to those who daily meet the problems of sickness in the office or in the home? Does not the expert owe something to the public?

There are financial questions. How can the experienced and successful medical man who has spent years in his education and in building up his practice afford to give up his income for the more meager stipend of a university professor? How can the professor so supported afford to associate on equal terms with his colleagues in practice; or, more important, how can he afford the travel and study essential to keep abreast of the times?

It must be confessed that these questions are difficult and not answered with entire satisfaction. But some things can be said.

The first is that the need is so great that the effort must be made. The duties of a university professorship are man-size. With all good-will, energy, loyalty and ability, no man can do his best for either master when he serves two. I have absolutely no complaint against the able doctors who have worked diligently in season and out of season and often for years without compensation, for the University of Minnesota. I freely acknowledge that these men have built up a fine medical school. But I submit that what was found true for law and engineering is equally true for medicine. The medical school can only reach its fullest usefulness when its principal chairs are filled and directed by men whose sole thought is the university and whose sole functions in life are those of the university, namely, teaching and research.

In graduate work particularly I submit that guidance of beginners in advanced work, the outlining of research projects, the time-consuming instruction of individual advanced students can only be done by those who have time for scholarly pursuits and are on the job all day long.

Secondly, I think it is a mistake to assume that the best professor is the doctor who has made the greatest success in practice. The qualities which make the practitioner are not entirely the same as the qualities which make the teacher and investigator. Opera stars are not usually the best teachers of singing, nor great painters the best instructors in art.

Fortunately, with the gradual evolution of the full-time idea some young men have been attracted to and have prepared themselves for a university clinical career. Eventually, the steps to the clinical professorship will be the same as those in other branches,—the graduate school, the full-time instructorship, assistant professorship, and so on. The search for and choice of a professor in a clinical branch will follow the same principles as the search for and choice of a professor of mathematics or anatomy. I confidently expect to see this condition of affairs before my active life in education is finished.

Thirdly, I think it is demonstrable that the professor on full time should not be entirely separated from active contact with the profession to which he belongs and its work in the world. Indeed, a university does not isolate any of its faculty from such contacts as are valuable to them and to the community. The Board of Regents of the University of Minnesota has adopted general rules governing outside work carried on by members of the staff in any of the faculties and colleges. These apply with equal force in the Medical School.

The relation of the clinical professor to the public and to his practicing brethren is a special case, not a *de novo* problem. It is complicated by the very responsible relation which subsists between doctor and patient, which brooks often of no delay nor substitution. It is complicated by the personal nature of the service rendered and the peculiar psychology of medical practice. Nevertheless, it is a special case to be met by the application of general principles such as those set down in the regents' rules.

Fourthly, I think that practitioner-teachers will always be needed in medical schools. They will

be needed because they can contribute something special and important from their active experience; and they will be needed because of the necessity of doing much of the clinical teaching to small sections of students in hospital wards and in dispensaries, thus demanding a large staff of part-time teachers. My picture of an adequate department in a metropolitan school—let us say, in internal medicine—is a full-time nucleus consisting of the head, one or more additional professors or associate professors, several assistant professors, instructors and fellows, and around this nucleus a practitioner or part-time group helping to care for the patients in the hospitals and instructing sections of students assigned to them.

Fifthly, I think the change from the part-time to the full-time system should be brought about gradually and not by revolutionary methods.

We have been proceeding on this plan at the University of Minnesota for several years. Up to now we have a full-time professor of pediatrics, full-time associate professors of surgery, medicine and of neurology, a full-time assistant professor of psychiatry and several full-time instructors. With the cordial approval of the former heads who will remain with the school in part-time work we have just added a full-time head in medicine and are canvassing for a full-time head in surgery. We expect to develop these three departments to the best of our ability before going further with the full-time plan.

Before detailing the various full-time schemes which have been tried, let me say a word about what is meant by full time. I know there are those to whom it means, more than anything else, such a relation that the professor gets no outside income from his profession. To me it means nothing of the sort.

The professor of history may write historical novels and use the university library for the purpose. The professor of geology may act as consultant for a mining company. The professor of anatomy may write a text-book and the professor of bacteriology may prepare a vaccine for a physician. Each may use his laboratory and other facilities in doing this outside work. Even the Dean of the Medical School has been called upon on two or three occasions to "diagnose and prescribe" for a sick medical school and has collected a "fee" for his services!

To me, full time means the full devotion of one's time and energy to the university, with only such outside activities as contribute to one's growth or fulfill the expected duties of the university to the community. It is evident that those outside activities must be rigidly subordinated to the primary duties of teaching and research. It is evident that the clinical professor cannot be in practice in the same unrestricted way, either in time or place, as the regular practitioner. Full-time work in other words is synonomous with a university career. What we are seeking is to safeguard such a career and at the same time permit desirable contacts with individuals and with the general profession.

The first method of establishing a relation to private practice for the full-time clinical teacher, as just defined, is the consultation privilege. The professor does not assume control of the patient, but advises with the physician in control. This is the arrangement which the University of Minnesota made with the head of pediatrics and some other full-time men about two years ago. It was agreed that such consultations should never be carried on to the extent that would interfere with university work, and as a check on this possibility a monthly report of such consultations and the time consumed is made to the dean.

The arrangement has worked all right, but is not without objections. It takes the professor away from the school, and no students (not even graduates or interns) get any benefit. It would be better if consultations were restricted to the University Hospital. It may be doubted whether the consultation without opportunities for full study, with laboratory examinations, is very valuable to the development of the professor concerned. The arrangement, moreover, is hardly applicable, under existing customs in practice, to such branches as surgery and obstetrics.

The second arrangement is the Hopkins or Rockefeller Foundation full-time plan. The professor receives a comparatively large salary. He is not restricted as to the amount or kind of private work, but the fees for such service go to the university or hospital.

This system has proved satisfactory in some instances. It has been criticized, but for the most part only on theoretical grounds. It is not acceptable to many clinical teachers, and has been tried and rejected at Columbia.

Our University has not adopted this plan, but doubtless would do so in individual cases if the acceptable candidate preferred this arrangement to some other.

The third arrangement is the Harvard modification, or what I called some years ago the geographical full-time plan. The professor agrees to do all his work at the university hospital. Beds are made available in which he may receive private patients, and he is permitted to collect his fees for such service in the regular way. The hospital makes the regular hospital charges.

Last summer I looked carefully into the operation of this system at the Peter Bent Brigham Hospital in Boston. There are about forty beds in the private pavilion. These are not assigned to particular individuals. On the contrary, vacant beds may be filled by any member of the staff, even down to those of instructor rank. In addition to hospital work, the members of the Brigham staff are permitted to consult outside.

The same arrangement as to beds for private patients holds at the Presbyterian Hospital, New York, for the clinicians of Columbia University. There are thirty-two beds in the private service, and a suite of examining rooms for the staff's private work is provided by the hospital. The non-medical personnel (secretary and nurse) is supported by the staff itself. Consultation work outside, Dr. Palmer informed me, is strictly avoided, as being distracting and bound to prove destructive of the professor's academic usefulness.

The Harvard full-time plan is the one our University has entered into with the new professor of medicine. He will have his office and laboratory in the University Hospital and be permitted to see private patients there. A limited outside consultation privilege has also been accorded to this professor. It is expected that others will come under the same general arrangement.

No particular number of beds has so far been set aside in the University Hospital for the private patients of members of the full-time staff, but it is understood that the number will be limited.

The salaries so far arranged for full-time clinical teachers at the University of Minnesota are not larger than those paid elsewhere in the University. The proposal favored by me is that these professors be on the so-called "Class A" or twelve months' basis, instead of being paid for the academic year only. In our Medical School this arrangement is particularly desirable because the school carries on teaching throughout the four quarters.

We do not go so far as to say that the problem of full-time clinical teaching has been solved. Our steps so far are to be considered experimental and tentative. We acknowledge, what has been said so often, that the ultimate success of any plan depends on the men who carry it into operation.

We think the arrangements we have made are fair to the medical profession. We think we have preserved, for our full-time men, necessary contacts with the public and desirable relations with the profession, and at the same time safeguarded the University. We shall be glad to have this system submitted to observation through a sufficient trial period, and shall court constructive criticism.

FEWER PEOPLE DIE OF "OLD AGE"

Forty years ago, almost 5,000 deaths in the State (New York) were attributed to "old age." Last year the number of deaths so classified was only 610, a decrease of almost 90 per cent. The number of deaths from all causes has increased 75 per cent in this period of time. What is the reason for the astonishing decrease in mortality from "old age"?

Most of these deaths fall in the age group "70 years and over," although some deaths are attributed to senility at earlier ages, occasionally even in early middle life. The population of the State has doubled and the number of old people has more than doubled since 1885. The decrease in the number of deaths from old age is, therefore, not due to a shrinking in the contingent of the population from which these deaths are drawn. The reason for this change lies in the more careful and scientific diagnosis of the cause of death. Where forty years ago, the death of an old person, because of indifferent reporting or for want of knowledge, was often attributed simply to the effects of old age, now an effort is made to establish a definite diagnosis in every case. The progressive reduction in deaths under this head marks the growing skill and attention on the part of the practicing physicians of the State.—*Health News*, March 8, 1926.

PUBLIC HEALTH IN MINNESOTA*

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Public health is a term much used, but little understood. The achievements in the prevention of disease and the prolongation of the average length of human life are as fascinating stories of progress as the development of modern industry itself. However, the rank and file of citizens, as even a large part of the medical profession, are not aware that this nation is committed to an intensive ever-increasing development of state and municipal control of the problems of public health.

Let us review a panorama of the organization of Public Health, as it stands today in Minnesota:

1. The state maintains a Board of Health which is the executive force controlling the field with its various departments of Records, Vital Statistics, Sanitation, Preventable Diseases, Venereal Diseases, and Child Hygiene.

2. The state maintains a general hospital at the University which accepts free and pay patients through an interlocking responsibility with the commissioners of all the counties.

3. The state provides a hospital for crippled children at Phalen Park and is undertaking more extensive activities as a result of the Eustis and Dowling endowments.

4. The state provides a tuberculosis sanitarium and, together with the several counties, maintains fourteen county sanatoria for tuberculosis for both free and pay patients.

5. The state, aided by private endowment, has recently opened special cancer and eye, ear, nose and throat hospitals on its campus at the University and the demand is pressing for a similar institute for psychiatry.

6. The state maintains tremendous hospitals for the mentally defective.

Certainly the state is committed to the business of public health on a wholesale basis.

Let us go further and consider what the average municipality is adding to this effort in the interest of public health:

1. The local health officer is responsible primarily for the control of contagious disease by well regulated quarantine measures and the following of contact cases, and is or should be actively stimulating all activities which promote better public health in the community.

2. The school nurse checks all absences and questionable illness in the school in an effort to eliminate every suspicious contagious case from contact with others and to prevent the return to school before recovery is complete. In this capacity she is a most valuable aid to the local health officer. The influence of a school nurse in health education is, of course, a large part of her contribution.

3. Ordinances of sanitation, among which are:

(a) Pure water supplies made possible by prevention of contamination, by filtration, and by chlorine treatment.

(b) Pure milk from clean dairies, properly handled in bottles, and a careful tuberculin testing of all cows.

(c) Proper sewage disposal, and the inspection of privies and cesspools.

(d) A municipal system of garbage collection and disposal.

(e) Sanitary inspectors to check the establishments dealing with food supplies and to enforce ordinances which particularly relate to nuisances.

4. A Department of Physical Education in the schools supervised by a special director emphasizing development exercises, good posture, and athletics.

5. Supervised public playgrounds under the direction of trained directors, to get the maximum health development in the right environment.

6. Municipal swimming pools built on correct engineering principles to provide clean water for the safety of the children.

7. Medical supervision of school children providing annual physical examination, calling attention to the physical defects which are acting as handicaps to progress in school advancement. Under this division we find increasing tendencies to free vaccination against smallpox and diphtheria and to free administration of iodine as a prevention of goiter.

Certainly, if the state is committed to the business of public health on a wholesale basis, the municipality is committed to that same business on a retail basis.

But this is not all, for people with further vision to serve, where the state and municipality have failed, have created great general welfare agencies.

*Presidential address before the 24th annual session of the Minnesota State Sanitary Conference, St. Paul, November 5, 1925.

Among these the following are of special importance:

1. The Minnesota Public Health Association maintained by the sale of Christmas seals, founded primarily for the purpose of leading the fight against tuberculosis, is now spreading its activities in health education to all the problems of physical fitness.

2. The Red Cross, originally of importance only in times of disaster, expanding as a result of the needs of the World War, has undertaken extensive public health supervision and has made its greatest contribution in Minnesota by the maintenance of county public health nurses.

3. The Public Health Nurses Association draws its membership from a total of 334 nurses actively engaged in this field of socialized medicine in Minnesota. Of this number, 210 are in the three large cities and 124 in the rest of the state instructing and guiding the public in its problems of individual and community health.

If the state and municipality are engaged in the business of public health as the wholesale and retail divisions, then these agencies of general welfare represent the departments of advertising and the salesmen on the road. Their business, while they do give excellent special service, is primarily to create further demands from the buying public to expect an ever-increasing output of the finished product of improved methods of public health from the manufacturing plants of the government of the state and the municipality.

What is the significance of this paternalistic and altruistic tendency in disease control? No thinking man can suppose there will be any backward step in the development of this great scheme of supervision of public health. We can no longer call these activities of public health socialistic or bolshevistic. The demand for them is imperative and will continue to increase in the future as it has in the past.

It is of particular interest to review the success of this business of public health as we read the records from the reports of vital statistics.

What conclusions can we logically make from these figures?

The reduction in the mortality of typhoid fever has been made not through superior diagnosis or treatment, but principally through provision of pure water and pure milk. The reduction in diphtheria mortality has been accomplished by the free distribution of antitoxin to every community and by the establishment of laboratories for culture diagnosis and quarantine control. The Schick test for susceptibility, toxin-antitoxin for prevention and antitoxin for treatment should reduce the figure of 217 deaths in 1924 from diphtheria in Minnesota. The decrease in the death rate from tuberculosis of 50 per cent in twenty years is the greatest monument imaginable to the vision and constant

TABLE I

Important Diseases with Decreasing Death Rates
Per 100,000

Disease—	Year	U. S. Rate	Minn. Rate
Typhoid Fever	1900	39.9	
	1910	22.8	32.1
	1920	7.6	3.0
	1924		1.46
Diphtheria	1900	43.3	
	1910	21.1	26.1
	1920	15.4	10.3
	1924		8.57
Tuberculosis	1900	201.9	
	1910	154.9	109.0
	1920	113.2	89.5
	1924		67.39
Diarrhea and Enteritis (under two years)	1900	108.8	
	1910	98.8	64.4
	1920	43.3	21.0
	1924		11.77
Pneumonia	1900	180.5	
	1910	100.4	86.7
	1920	133.7	89.0
	1924		70.55

efforts of the leaders in public health in Minnesota. Enteritis in children under two years of age, once a serious menace, has succumbed to pure milk and anti-fly campaigns. Pneumonia incidence decreases as the hygienic habits of living and industry are improved and the common cold is treated intelligently.

These statistics prove, if nothing else, that the balance sheet of the business of Public Health in the state of Minnesota is a credit to the organization, and the dividends to the people of the state represent a high percentage rate on the investment. A business so highly organized, so capable of such an excellent finished product as this balance sheet

reveals, will not be contented merely to carry on in the pathways of the past. New fields must be opened and new problems created for an expanding personnel to conquer.

Two paramount problems challenge the field of public health in Minnesota today. Each requires a different method of attack and a solution of either can be possible only by a more intensive campaign of public co-operation than has yet been attempted.

The first of these is the challenge of the diseases with increasing death rates which the rank and file of the medical profession must attack from a new viewpoint.

TABLE II

Important Diseases with Increasing Death Rate
Per 100,000

Disease—	Year	U. S. Rate	Minn. Rate
Scarlet Fever	1900	10.2	
	1910	11.7	14.5
	1920	12.5	4.8
	1924		8.17
Nephritis	1900	89.0	
	1910	111.4	70.9
	1920	103.4	83.3
	1924		58.34
Cerebral Hemorrhage, Apoplexy	1900	67.5	
	1910	75.9	42.6
	1920	81.0	60.1
	1924		
Heart Disease	1900	123.1	
	1910	142.3	81.5
	1920	141.8	113.7
	1924		135.69
Cancer	1900	63.0	
	1910	76.1	67.2
	1920	83.4	95.4
	1924		101.04

Here we have had no assistance from public health education, or propaganda, state subsidy, or altruistic agencies. Scarlet fever, through the brilliant achievements of the Dicks and others, will soon take its place in Table I, depending largely on how active an interest the profession takes in the use of the established means of its prevention among the proven susceptibles. In spite of our scientific achievements in pathology, immunology and physiology, the ghosts of nephritis, cerebral hemorrhage, heart disease, and cancer go marching on without apparent hindrance. The helplessness of our present methods of combating these diseases is apparent.

A new conviction has developed, and the leaders of the American Medical Association have begun a campaign to enlist the interest of the medical profession and the public in the latest weapon against disease—the periodic medical or physical examination. Early recognition of defects and early institution of treatment, factors which have proven so effective in the warfare against tuberculosis, are now to be used against nephritis, hypertension, cardiac disease and apoplexy, just as they are already being used in the fight against cancer by the National Cancer association. The possibilities of this new viewpoint are as great as we have the energy to make them. The medical profession cannot be successful alone in this effort to educate the public. All public health activities must fall into line in a new movement of mass education, with maximum health from babyhood to old age, as the chief objective.

The second paramount problem of public health is the inequality of health education and health service in the various levels of society and units of government. There has rapidly developed in the last decade a vast gulf between the methods and results of health supervision in the rural, as compared with the city life of our state. In spite of general state regulations, there is no uniformity of protection from contagious diseases in the country, as compared to the city. There is no uniformity of opportunity for the country boy and girl to grow up in the knowledge of the principles of preventive medicine, which is offered to the boy and girl living in the average progressive city. As an evidence of the total lack of uniformity in the machinery of health administration in Minnesota, consider the survey that was made last year by the State Board of Health in a questionnaire sent to all health officers. Here is a summary of the facts ascertained:

Of eighty-seven counties, only four reported paying an annual salary for a county health officer, ranging from $50 to $600 a year. Only seven counties report keeping permanent records of communicable diseases.

Of ninety cities only forty-one report paying annual salaries, the great majority ranging from $25 to $350 per year. Only nine pay above $500. Permanent records are kept in only thirty cities.

Of 635 villages, 109 report paying some salary ranging from $10 a year to a fee basis per case. Only seventy-three report the keeping of permanent records.

There are 1,961 townships. Of those reporting, seven pay an annual salary of $8.00 and $15.00, 108 pay on a varying rate of mileage basis, four on flat rate of from $1.00 to $5.00 per case.

Only fifty-two townships report keeping permanent records of contagious diseases.

These figures show a complete lack of system and co-ordination of effort. The greatest weakness lies in the small town, village and township. An almost universal criticism was received against the ineffectiveness of the local boards of health in the townships and villages and the lack of power of county health officers.

So much for the present machinery of public health in Minnesota. We rightly ask what has been its results? Dr. Charles Mayo, within the last year, stated in a public address that the city youth today is healthier than his country cousin. The army draft of the world war indicated a greater percentage of defective young men from the strictly rural population than from the cities. A survey last year in the University of Minnesota, by Dr. Diehl, analyzing 3,478 physical examinations of male students, showed a much higher percentage of physical defects in students coming from rural communities than from the cities with a population above 50,000. In recent years the death rate of the city of New York with all its slums has been lower than the death rate in rural New York. In 1921, for the first time in the history of accurate statistics in the United States, we find a higher death rate for babies under one year of age in rural America as compared with urban America. In a survey of the United States Public Health Service of vital statistics in the registration area of the United States, if the rural districts had made the same progress in disease prevention during the last 20 years, as has been made by the cities, 35,000 lives would be saved annually. Is it not apparent that new machinery in keeping with changed conditions of modern life is necessary if the children in the villages and rural communities are to have their equal opportunity to grow up in the security of good health.

As a solution for the failure of rural America to be supplied with adequate health information and protection, a new movement has developed in eastern and southern states under the influence of the International Health Board co-operating with the United States Public Health Service in establishing full time county health organizations capable of carrying into the remote rural communities all the service of modern health education. An effort last year to permit such an organization to be established in Minnesota to take the place of the present inadequate township system of health supervision, failed in the last legislature, because of a lack of preliminary education of the public to the problem, a lack of organization to present it properly, and an indifference of the legislature to its need. Supervision of rural school education by a county superintendent of schools is considered a necessity. Supervision of law enforcement in rural districts by a county sheriff and a county attorney is accepted as a fundamental necessity. Minnesota has pulled itself out of the mud by abandoning the old poll tax system of building roads in the isolated units of township administration and centralized that work in a county and state system of connecting and co-ordinating highways to the great advantage of everyone. The day cannot be far distant when we will wake up to the realization of the value of establishing health supervision in rural Minnesota by giving to county health officers power and responsibility to guard the public in health matters, as it is now supervised in education, law enforcement and road building. Minnesota will take its place among the forward moving states when the public learns the value of these health measures, for then the public will demand for itself what it is failing to receive. This sanitary conference could do nothing greater than to make the accomplishment of this purpose its main objective.

In reviewing this remarkable development of public health in Minnesota, a vision of the future is most appealing. The very nature of the problems which face us has made the name of this organization, "The Sanitary Conference," an outdated title. The problems of sanitation have largely been solved. The possibilities of that larger term, Public Health, have ever been increasing. The viewpoint of this paper suggests that we acquire a new name—The State Public Health Conference. In so doing, it is further suggested that in the future this conference be a great joint meeting of the health officers of the state, the members of the Public Health Nurses Association, the delegates of the Minnesota Public Health Association, the members in the Physical Education Section of the Minnesota

Education Association, and of any other groups of welfare agencies which can contribute benefits by actively participating in such a joint session. Section meetings of these groups and a well balanced joint program should offer the greatest opportunity of combined effort for an early solution of these important problems of public health. Working at tangents under the present methods is a duplication of effort, inefficient and expensive. Combining our powers is in itself an inspiration to successful achievement.

A challenge is offered to the officers of the coming year to make this union of public health agencies a reality in the holding of a great combined State Public Health Conference a year from today.

A CATALOG OF "CURES"

A marvelous category of alleged cures for this common ailment (poison ivy) of the links, the field, the footpath, and the park has been collected by the Minnesota investigator, Dr. E. D. Brown. Here are some of the things people have sworn by as cures:

Lime water and olive oil in equal parts.
Bruised leaves of belladonna mixed with fresh cream.
Tincture of chloride of iron.
Spirits of turpentine.
Hydrogen dioxide.
Brine from pickled fish.
A boiled decoction of cup oak bark.
Potassium chlorate.
Fluid extract of eupatorium.
Arsenic, taken internally.
Tincture of poison ivy *(Rhus Toxicodendron)* taken internally.
Coffee applied to the irritated spot.
Milk and cream poultices.
The swamp button bush, steeped in water.
Linseed oil mixed with lime water.

Of all these he merely comments that the ones that are applied externally and are irritants are more likely to be of some use than the others.—*Minnesota Chats*, Feb., 1926.

Measles is the most serious acute disease in existence. In the last twenty-five years, the total mortality due to diphtheria has fallen off in ten of the principal European countries by 67 per cent, scarlet fever mortality by 46 per cent. and whooping-cough by 43 per cent. Mortality from measles over the same period has fallen off only 10 per cent. It is so prevalent that hardly any one in any part of the world can hope to avoid it. The figures adduced recently by *The American Journal of Hygiene* go to show that more than 90 per cent of urban populations in England, Canada, and the United States contract measles at some period of their lives. In the whole of Europe, with the exception of Russia and the Balkans, measles caused 700,167 deaths in the ten years from 1900 to 1910. In the United States, in the zones subject to notification, measles has caused more than 100,000 deaths in the twenty years from 1901 to 1920. —*Literary Digest*, March 13, 1926.

REQUIREMENTS FOR ADMISSION TO STATE AND COUNTY SANATORIA AND SANATORIUM SUPERVISION BY THE TUBERCULOSIS DIVISION OF THE DEPARTMENT OF PUBLIC INSTITUTIONS*

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St. Paul

The advanced consumptive alone has a clear conception of what tuberculosis is as a disease. To him it means suffering, mental and physical. He feels and he more or less realizes that he is in the clutches of a foe who is trying to squeeze out his life and terminate his existence. To him it is a struggle and the foremost thought in his mind always is that he is grappling with an enemy. Whatever unnatural phenomena may arise in him and whatever changes may take place in his physiological functions and in his anatomical construction are merely indications to him of the victory of the enemy. In the same way and for the same reason amelioration of suffering and of discomfort are signs to him of victory.

What tuberculosis has meant to mankind and what it means even at the present day in suffering, in loss and interference with human happiness, is beyond the grasp of human mind. It has been the great scourge of all civilized peoples as far back as history records anything about human affairs. It is much less of an affliction now than it has been at any time in the past, though even now it claims many victims and levies a heavy tax upon man's happiness. The discovery of its cause and modern intimate knowledge of the life history of the tubercle bacillus bring it within the reach of human endeavor to wipe it out. All over the civilized world there is now an active campaign to accomplish this end and the results so far obtained give promise of ultimate victory.

And in this world-wide battle toward the eradication of the white plague the State of Minnesota is playing no small part.

In 1901, the legislature authorized the appointment by the Governor of an Advisory Commission, consisting of three physicians, for the purpose of investigating the advisability of establishing a State Sanatorium. The Commission rendered a full re-

*Read before the 24th annual session of the Minnesota State Sanitary Conference, St. Paul, November 5, 1925.

port of their investigation to the legislature of 1903. As a result of the report and recommendation, the 1903 legislature authorized the establishment of the State Sanatorium, "on property near Walker," and authorized the appointment of five physicians to serve on the Advisory Commission without remuneration, excepting expenses incident to their work.

Full power to manage, control and govern the State Sanatorium was placed under the State Board of Control. The duties of the Advisory Commission were limited to the approval of a site (near Walker, Cass County), approval of suitable plans, and the appointment in each county in the state of physicians to examine persons applying for admission. Such limited duties are still the functions of the Advisory Commission so far as the State Sanatorium is concerned.

fund and its expenditure under the control of the Commission, which had the following membership: Dr. H. Longstreet Taylor, President, St. Paul; Dr. P. M. Hall, State Sanatorium, Ah-gwah-ching; Dr. C. L. Scofield, Benson; Dr. P. A. Smith, Faribault; Dr. Robinson Bosworth, now of Rockford, Illinois.

Dr. Taylor, of St. Paul, served as President of the Commission from 1901 until 1918. It is largely because of his vision and untiring efforts that Minnesota today possesses a system of tuberculosis hospitals unexcelled by any state in the Union.

This system of tuberculosis hospitals, or sanatoria, consists of one state sanatorium and fourteen county sanatoria. These institutions, their names, locations, the counties supporting them and capacity are listed in Table I.

Institutions, other than county sanatoria, which

TABLE I

SANATORIA	LOCATION	COUNTIES	CAPACITY
Nopeming*	Nopeming	St. Louis	200
Otter Tail County	Battle Lake	Otter Tail	46
Tuberculosis Pavilion	St. Paul	Ramsay	125
Mineral Springs	Cannon Falls	Goodhue, Rice, Dakota	40
Glen Lake	Oak Terrace	Hennepin	600
Sunnyrest	Crookston	Polk, Norman	60
Lake Julia	Puposky	Beltrami, Koochiching, Hubbard	48
Sand Beach	Lake Park	Clay, Becker	50
Buena Vista	Wabasha	Wabasha, Winona, Olmsted	24
Riverside	Granite Falls	Chippewa, Lac Qui Parle, Yellow Medicine, Renville	50
S. W. Minnesota	Worthington	Lincoln, Lyon, Pipestone, Murray, Cottonwood, Rock, Nobles, Jackson	55
Oakland Park	Thief River Falls	Marshall, Roseau, Pennington, Red Lake	32
Fair Oaks Lodge	Wadena	Todd, Wadena	30
Deerwood	Deerwood	Crow Wing, Aitkin	24

The total bed capacity of these institutions is 1,384.

*A new infirmary is in process of building at Nopeming which will accommodate 50 patients.

TABLE II

State Sanatorium	Walker	325 beds
THREE PRIVATE INSTITUTIONS:		
Pokegama	Pine City	50 beds
Home Sanatorium	Rochester	12 beds
Oronoco	Rochester	24 beds
Park-View (The tuberculosis Division of the Minneapolis General Hospital)	Minneapolis	130 beds
Thomas Hospital	Minneapolis	65 beds
U. S. Veterans Hospital No. 68	Minneapolis	88 beds

However, the legislature of 1913 authorized the establishment of county sanatoria, appropriated one-half million dollars to assist counties in building and maintaining sanatoria and increased the duties of the Advisory Commission by placing this

provide beds for the tuberculous are listed in Table II.

This total is 694 beds, which, with 1,384 beds in our county sanatoria, gives a grand total of 2,078 beds for the tuberculous in the State of Minnesota.

At the 1925 session of the state legislature by an act in relation to the organization of the state government the Advisory Commission of the State Sanatorium for Consumptives was abolished. Under the title of the State Board of Control the Department of Public Institutions was created. This Department now exercises the rights and powers and performs the duties conferred by law upon the Advisory Commission of the State Sanatorium for Consumptives.

Briefly, the duties of the Department of Public Institutions are as follows: When a county or group of counties have decided to build, and have raised the necessary funds for building, a tuberculosis sanatorium, the sanatorium commission may decide on the location, establishing and maintenance of sanatorium building upon the approval and consent of the Department of Public Institutions. But before final action is taken, plans and specifications must be submitted to the State Board of Health.

The Department of Administration and Finance has full power and control over the construction and equipment of any such sanatorium whose establishment has been determined upon by the county sanatorium commission.

A county, or group of counties, wishing to establish a sanatorium may, through the Board or Boards of County Commissioners, appropriate one-half the necessary funds for the establishment, construction and equipment of the same. The State Treasurer will then pay out of funds provided for same, one-half the cost of the erection and equipment of each such sanatorium, including cost of site, this payment being made in the manner provided by law for the payment of expense incurred by the Department of Administration and Finance in the erection and equipment of public buildings, provided the amount contributed by the state towards the cost of the erection and equipment of each such sanatorium, including site, shall not exceed fifty thousand ($50,000) dollars.

For the maintenance of each free patient treated in the sanatorium, the sum of five ($5) dollars per week is paid to said county, or group of counties, by the State Treasurer monthly upon warrants of the State Auditor, drawn upon the State Treasurer, provided that the Executive Secretary of the Department of Public Institutions certifies that the institution has been properly conducted.

The first consideration in the management of each sanatorium is the welfare of the patient. As a result a high standard is maintained in all departments of the institution. Each sanatorium commission must engage a full-time medical director and superintendent. These positions may be filled by one individual. This is the case in all the sanatoria of this state except one, where the superintendent is a graduate nurse, experienced in the management of a tuberculosis sanatorium, but there is also a full-time medical director maintained by the institution. All medical directors of the sanatoria are physicians trained in the diagnosis and treatment of tuberculosis.

Any person suffering from tuberculosis, who is a legal resident of the State of Minnesota, that is, who has decided upon Minnesota as his home state and has resided in the state for at least one year, is eligible for care and treatment in any of the county sanatoria of the state. The sanatorium commission fixes the amount to be charged for the care, treatment and maintenance of each patient. This rate for patients from the district supporting a sanatorium varies from $7.50 to $10 per week, one institution charging $21 per week. For cases coming from counties not supporting a sanatorium, the weekly rate varies from $12.25 to $21, most of the institutions recently having raised their rate to $19.25 per week, the average cost per week for the care, treatment and maintenance of a patient in a county sanatorium of this state.

When a patient from a sanatorium district is unable to pay, he is admitted as a free case, the state paying $5 weekly toward his care and treatment, the remainder being paid by the sanatorium. When a patient is admitted to a sanatorium, his financial condition, or the financial condition of those legally liable, is investigated by the sanatorium commission or its representative, and if the patient is found to be unable to pay he is admitted free of charge. If he is found to be financially able to pay some amount toward his maintenance, he is admitted as a part-pay case, and if he is able to pay the full amount, he is expected to do so.

In making application for admission to a sanatorium the method of choice is to have the person concerned have his physician write directly to the superintendent of the sanatorium asking for an application blank. This blank is filled in by the physician, giving all the required information regarding the patient, his legal residence, physical

and financial condition, etc., and is returned to the superintendent of the sanatorium.

Minimal or beginning cases of tuberculosis and those classified as moderately advanced cases, but who are in otherwise good condition, are preferred by the State Sanatorium. The County Sanatoria are, by law, required to give far advanced cases preference for admission. Each sanatorium superintendent keeps two lists of applicants—one for those from the sanatorium district, the other for applications from outside the district, the applications being listed according to the order of their receipt. It is only after the list of names from the sanatorium district is exhausted that recourse is had to the list from outside the district. No doubt, some of you here have, in late months, made application to a sanatorium in behalf of someone suffering from tuberculosis in whom you were interested, only to be told that there are no vacancies. This is both a fortunate and an unfortunate condition. It is fortunate in as much as it has proven the value of the institution and its teachings, on account of which the condition which existed some ten years ago, namely, the horror of the tuberculous individual at having to go to a sanatorium, has now changed to a situation where the person who receives a diagnosis of tuberculosis immediately seeks sanatorium care for himself.

The unfortunate situation of not being able to accommodate patients applying for care at a sanatorium shows that there are still certain districts which are not awake to the great need for more sanatorium beds to take care of the tuberculous in their community. It is particularly unfortunate for the suffering victim, who probably must needs continue being sick amid poor home conditions, with little or no medical and nursing care, and finally come to the fatal end. It is said, "Public health is purchasable. Within natural limitations a community can determine its own death rate." In 1923 there were 1,846 deaths from tuberculosis, all forms, in Minnesota. In 1924 there were 1,710 deaths reported—136 deaths less than the year before. Were we to go back and compare previous years, since the anti-tuberculosis work has been started in Minnesota, a more or less similar lowering of mortality would be shown.

Statistics for this state also show that the decrease in mortality is greater in counties supporting sanatoria than in the counties not supporting one.

A great deal also depends on the following up of patients discharged from the sanatorium, and this work is carried on through the permanent chest clinic and the visiting nurse, for many patients who have spent sufficient time at an institution and are in good enough condition to do so are allowed to return to their homes to continue their "cure taking," under supervision, until a cure is effected. It seems quite unnecessary for all patients to remain in a sanatorium until a permanent cure is made, as this most often means a period of years, and he thus would be depriving another patient of his rightful chance to enter a sanatorium for treatment and training.

We, who are on the battlefield fighting against the great white plague, are surveying an area too large to be depicted before your imaginations in a few short minutes.

But may I in closing make a plea for our fellow man or woman who is suffering from tuberculosis?

Let us all join arms to fight the worst disease to which the human body is subject, the White Plague. It is a world-wide conflict, and while no one of us can conquer single-handed, yet we can all of us work for better living conditions and create a strong public sentiment in favor of them. When we recognize how many human lives will thus be saved yearly, we can see that it will be fully worth while.

If you would help in the fight you could do it in several ways: first, by giving as much as you can of your money, time and influence to help the private agencies which are dealing with the tuberculosis problem, such as your local anti-tuberculosis organization and your local charitable societies; second, by helping as a citizen and a voter to secure adequate appropriations for your Board of Health and your local sanatoriums, hospitals and dispensaries; finally, by backing up the public health campaign by your words, your interest, your action and your influence.

PHYSICIANS LICENSED AT THE JANUARY, 1926, EXAMINATION TO PRACTICE IN MINNESOTA

BY EXAMINATION

Name	School and Date of Graduation	Address
Anderson, Gilbert Christian	Columbia, M.D., 1917	Rochester, Minn.
Anderson, Harold Theodore	U. of Minn, M.B., 1925	Minneapolis, 329 Union St.
Bayley, Emery Covell	U. of Minn, M.B., 1925	Lake City, Minn.
Berge, David Oscar	N. W., 4 yr. Cert. Med., 1925	St. Paul, Minn., Ancker Hospital
Beyer, Wm. S.	U. of Minn., M.B., 1925	Minneapolis, 1082 17th Ave. S. E.
Brockbank, Thos. Wm.	Georgetown, M.D., 1924	Rochester, Minn.
Burton, Carl Gustav	U. of Minn., M.B., 1925	St. Paul, Minn., Bethesda Hospital
Dassett, Jos. Wm.	U. of Minn., M.B., 1925	Minneapolis, 3128 Hennepin Ave.
Dodge, Warren Maynard, Jr.	U. of Minn., M.B., 1925	Farmington, Minn.
Eich, Matthew	U. of Minn., M.B., 1925	Minneapolis General Hospital
Etheredge, Shuler Hardin	Med. Coll. of So. Car., M.D., 1924	Rochester, Minn.
Farabaugh, Charles L.	U. of Minn., M.B., 1925	St. Paul, Ancker Hospital
Forster, Walter Livingstone	Rush, Cert. Med., 1925	St. Paul, Ancker Hospital
Freedman, Newman Barnett	McGill, M.D., 1923	Rochester, Minn.
Freise, Paul W.	N. W., Cert. Med., 1925	Minneapolis, St. Mary's Hospital
Gillespie, James Ogilvie	U. of Minn., M.B., 1925	Forest River, N. D.
Hart, Wm. Eustis	Wash. U., Mo., M.D., 1925	Minneapolis, St. Mary's Hospital
Hunter, Elmer Noble	U. of Minn., M.B., 1925	Detroit, Mich., care of Receiving Hospital
Huseby, H. Walter	U. of Minn., M.B., 1925	Minneapolis General Hospital
Jacobson, Clarence	U. of Minn., M.B., 1925	Duluth, 400 N. 58th Ave.
Jensen, Herman H.	U. of Minn., M.D., 1925	Minneapolis, U. of Minn.
Johnson, Olga Holie	U. of Minn., M.B., 1925	Minneapolis, 512 Delaware
Kepler, Edwin John	U. of Minn., M.D., 1925	Rochester, Minn.
Lufkin, Nathaniel Hall	U. of Minn., M.B., 1925	St. Paul, 617 Goodrich
Macfarlane, Peter Harvie	U. of Minn., M.B., 1925	Minneapolis, 515 Ontario
McDonald, Robert Edmund	U. of Minn., M.B., 1925	Minneapolis, 3952 Aldrich
McMahon, Leo Hartney	St. Louis U., M.D., 1925	Breckenridge, Minn.
Maxwell, Harvey Cecil	U. of Minn., M.B., 1925	Minneapolis, 3303 2nd Ave. S.
Meland, Ernest Lawrence	U. of Minn., M.B., 1925	Pelican Rapids, Minn.
Muir, Edwin Clay	U. of Minn., M.B., 1925	Winona, Minn.
Parsons, Eloise	Rush, M.D., 1925	Rochester, Minn.
Rens, John Louis	U. of Minn., M.B., 1925	Minneapolis, 2927 46th Ave. S.
Schroeder, Wm. Frederick	U. of Minn., M.B., 1925	Minneapolis, 1063 13th Ave. S. E.
Sitar, Richard Frank	N. W., Cert. Med., 1925	St. Paul, Ancker Hospital
Somerfield, Harry Alexander	Stanford U., M.D., 1925	U. of Minnesota
Sontag, Lester Warren	U. of Minn., M.B., 1925	Heron Lake, Minn.
Stephenson, Robert Abram	Columbia, M.D., 1918	St. Paul, St. Luke's Hospital
Swenson, Orvie John	U. of Minn., M.B., 1925	Minneapolis, 815 8th Ave. S.
Tuttle, Glen Willis	U. of Minn., M.B., 1925	Minneapolis, University Hospital
Warner, Harry Reuben	U. of Minn., M.B., 1925	St. Paul, 2232 Langford
Wenaas, Elmer Justin	Geo. Wash. U., M.D., 1924	Mt. Iron, Minn.
Wilhelmj, Chas. Martell	St. Louis U., M.D., 1922	Rochester, Minn.
Winer, Louis Harry	U. of Minn., M.B., 1925	Eveleth, Minn.

LICENSED THROUGH RECIPROCITY

Allen, Edgar Vannice	U. of Neb., M.D., 1925	Rochester, Minn.
Bailey, Wm. T.	Tufts, M.D., 1909	Nopeming, Minn.
Fortin, Harry John	N. W., M.D., 1916	Rochester, Minn.
Jones, Robert Duval, Jr.	U. of Pa., M.D., 1924	Rochester, Minn.
Kleinheksel, John Lewis	U. of Mich., M.D., 1924	Rochester, Minn.
Shumate, John Kenly	Med. Coll. Va., M.D., 1921	Nopeming, Minn.

LICENSED ON NATIONAL BOARD CERTIFICATE

Johnson, Norman Percy	Harvard, M.D., 1923	Minneapolis, 1701 Irving Ave. S.
Smith, Harry LeRoy	U. of Iowa, M.D., 1916	Rochester, Minn.

MINNESOTA MEDICINE

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EDITORIAL

The Constitution of the Association

One of the important business matters which will come before the House of Delegates of the State Medical Association when it meets in St. Paul, May 17, will be the consideration of changes in the constitution of the Association proposed by the special committee appointed by the Council last May.

The committee has worked hard at their task. The constitution has been brought up to date and copies of the constitution with certain proposed additions have been mailed to officers and delegates of the various component societies. It behooves each delegate to study the proposals and to determine how his constituents stand on each proposal. Only in this way will confusion and an endless wrangle be avoided.

It is proposed that the phrase "to promote public health" be added to the purposes of our Association. The profession is peculiarly in a position to give advice in public health matters and the promotion of public health is one of its proper functions, but this addition should not be construed as an assumption of responsibility for the public health. This responsibility lies with the public as a whole and most of the burden falls on state and municipal health departments and primarily on the legislature.

A new class of "emeritus members" is suggested. According to this provision any member of twenty-five years' standing in a component county society and having reached the age of sixty may, if he so desires, ask to be placed on the emeritus list of his county society. Such emeritus members in a county society will automatically become emeritus members of the State Association with all the rights and privileges of membership except those of voting and subscription to the journal. It is only fitting that such a courtesy be extended to members of long standing.

It is further suggested that authority be given the treasurer to sign checks authorized by the secretary alone. For the most part signature of checks by the president has been a cumbersome and oft-times a perfunctory performance. The treasurer's membership in the Council and House of Delegates enables him to know first hand what expenditures have been authorized. The Council will doubtless see to it that bonding of the treasurer will cover any possible irregularity of a secretary.

At times questions have arisen between meetings of the House of Delegates over which the Council has felt it had no authority. It is proposed in a new section to delegate the powers of the House of Delegates to the Council during such interim.

Each of the proposed changes in our constitution should receive the careful consideration of the officers and delegates prior to the meeting in May.

The Crime Wave

The unquestionable increase in crime throughout the country in recent years is a subject which vitally concerns everyone. The remedy offers a problem which in a democracy such as ours will have to be solved by the people themselves.

An interesting and at the same time discouraging report prepared by the Anti-Saloon League of the number of arrests made in some 300 American cities shows: (1) That after a temporary decline

immediately following national prohibition the number of arrests for drunkenness had returned by 1923 to about the pre-Volstead figure; (2) that arrests for other infringements of law have markedly increased during 1922 and 1923. The more recent figures for 1924 and 1925 are not given, but presumably the curve is on the rise.

It must be remembered that the more personal conduct laws that are enacted by our legislatures, the more violations will occur and presumably the greater number of arrests will result. We have too many laws of this character already. They are so numerous that one must become a student of law in order to approach the possibility of being a law-abiding citizen in the fullest sense of the word. The useless and absurd laws now on the statute books of our state should be repealed. For instance, (1) it is unlawful to play on Sunday (this means golf as well as other forms of relaxation); (2) it is unlawful for a hotel keeper to use sheets less than ninety-nine inches long before washing—these sheets must also be at least two feet wider than the mattress which they cover; (3) cranberries may not be picked on other people's property before September 1 each year, the inference being that blueberries may be picked before that date and cranberries after that date irrespective of where they grow; (4) it is unlawful to make purchase of or give away a cigarette containing aught but tobacco. (How about some popular brands of cheap cigarettes?)

Certain reforms in our methods of the administration of justice are pressing if criminals are to be deterred. The courts are very commonly held responsible for cumbersome procedure which defeats swift meting of justice, whereas defects in the criminal procedural laws are to blame. At the last session of the state legislature certain changes in court procedure in the interest of more speedy and sure administration of justice were proposed by a committee of judges headed by Judge Sanborn, now of the United States District Court for the District of Minnesota. These recommendations had been endorsed by the legal profession, the county attorneys and the district judges of the state, but failed to pass except in one or two minor instances simply because they failed to receive the backing and support of the public generally, which their importance demanded. About the only interest taken in the proposed legislation was made by criminal lawyers, who are naturally opposed to reforms in the criminal procedural laws.

For fear that an innocent citizen may not receive full justice in the courts, certain laws are in effect which give the criminal a very great advantage over the prosecution. For instance, in the selection of jurors in the trial of a criminal case, if the offense charged be punishable with life imprisonment, the state is entitled to ten, while the defendant may have twenty, peremptory challenges. It is reversible error for the prosecutor to call the jury's attention to the defendant's failure to testify in his own behalf. The state must first sum up and is given no opportunity to reply to the closing arguments of the defense. Each accused individual has the right to demand a separate trial even though the evidence may be identical against a group of a dozen or more who have participated in the same offence. The recommendations above mentioned were offered, among others, in the interest of removing some of the handicaps of the state in prosecuting criminal cases and in the furtherance of justice, but the legislature would have none of it.

The question of the advisability of continuing the indeterminate sentence and the parole board are of comparatively minor importance. As a matter of fact the average time served by sentenced criminals since the indeterminate sentence has been in effect has been materially greater than before. Figures show that about one-third only of the prisoners receiving an indeterminate sentence are ever paroled, one-third are conditionally discharged, and one-third serve the maximum sentence. Of those paroled only 20 per cent are returned to prison for breaking their parole, and of this 20 per cent, less than half are returned for committing a serious offense. If the fact that a few paroled prisoners do break their parole is ground for abandoning the parole system, then by the same process of reasoning no convicted individual should ever be released from imprisonment, since all agree that many discharged prisoners also commit crimes.

Few realize what a nation-wide organization of professional criminals exists. The recent investigation of nation-wide bootlegging serves to illustrate the true state of affairs. If the organization of crime is to be fought successfully, county, state and national government must meet the criminals with increased financial expenditure and manpower.

Incidentally, our judges are shamefully under-

paid. A lawyer accepts a position as judge only at great personal sacrifice financially. It is not uncommon for lawyers on both sides of some important case to receive more in that one case than the judge who tries it receives in a year. How can we expect our courts to be manned by men of superior ability when such a situation exists?

Much might be said of the need for more moral and spiritual training for the younger generation. The effect of such present-day influences as the movie, automobile and salacious literature doubtless plays a part. National prohibition is perhaps too young to conclude what effect it has had by transferring the question of drinking from a moral to a legal status.

Fewer laws, better legislation, increased resistance to organized crime offer the only solution to the increasing crime in our country and this will only be accomplished by an awaking of public opinion.

Dr. Thomas McDavitt

The organized medical profession will keenly feel the passing of our friend and confrere, Dr. Thomas McDavitt. Some members of the profession acquire excellence in a narrow field of professional endeavor and do little or nothing for the activities of organized medicine. This cannot be said of Dr. McDavitt. Although a specialist he possessed unusual executive ability and placed this ability at the disposal of our state and national organizations.

As secretary of the Minnesota State Medical Association from 1900 to 1919 he rendered valuable service to the organization in this state. As trustee of the American Medical Association and chairman of the finance committee he attained national recognition of his executive ability and his counsel was ever in demand.

Few realize the trials and tribulations of the secretary of a state board of medical examiners. As secretary of the Minnesota Board, Dr. McDavitt repeatedly had the discouraging experience of having his efforts in carrying out the law relating to medical practice frustrated by the courts.

Dr. McDavitt was ever ready to tender his counsel and advice to the younger members of the profession and it is with appreciation and regret that we join with his many friends in expressing our deep sense of loss.

OBITUARY

DR. THOMAS McDAVITT

Dr. Thomas McDavitt was born May 15, 1857, in St. Louis, Missouri. His father, Dr. Virgil McDavitt, born in Bowling Green, Kentucky, in 1835, and his paternal grandfather, born in 1795 in Rockbridge County, Virginia, were both physicians. A brother, also a physician, practiced at Bowling Green, Kentucky.

Dr. McDavitt received his medical training at Northwestern Medical School, graduating in 1879. He first became associated with Dr. Dwight F. Brooks at Minneiska, Minnesota, in 1880, moving to Winona, where for about ten years he was associated in general practice with Dr. J. B. McGaughey.

In 1889 he went to Europe, where he spent some thirteen months in the eye and ear clinics of Vienna, Paris and Berlin. Upon his return he came to St. Paul, where for thirty-six years he specialized in eye and ear diseases, being associated for the first seven years with Dr. John Fulton.

Always interested in medical organization and possessing more than ordinary ability as an executive, Dr. McDavitt acted from time to time in various official capacities. From 1900 to 1919 he was secretary of the Minnesota State Medical Association. In the early nineties and continuously from 1912 to the time of his death he was secretary of the Minnesota State Board of Medical Examiners. He served last year as president of the Federation of State Medical Boards. At the time of our participation in the World War he took an active part as a member of the Advisory Board of the War Department, and also as a member of the Volunteers Medical Service Corps. He was a charter member and in 1915 president of the Minnesota Academy of Ophthalmology and Otolaryngology. Perhaps, Dr. McDavitt was best known nationally as a member of the Board of Trustees of the American Medical Association, acting at one time as chairman. He was a member of the Board from 1913 to the time of his death. He was also a member of the American College of Surgeons and a Mason.

Dr. McDavitt had been suffering from heart trouble following an acute attack a year ago. His death on the morning of March fourth nevertheless came as a shock to his many friends and associates.

Dr. McDavitt married Harriet Easton of La Crosse, who survives him. He is also survived by his mother, Mrs. Caroline McDavitt, and his sister, Mrs. Ira Calkins, both of Quincy, Illinois, and three daughters, Mrs. Charles Eastwick Smith of St. Paul, Mrs. Heber G. Stout of Milwaukee, Mrs. Donald Konantz of Winnipeg, and six grandchildren.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA STATE MEDICAL ASSOCIATION

May 17-19, 1926, St. Paul

Joint Meeting With

St. Paul Clinic Week Section of the

Ramsey County Medical Society

May 20, 1926, St. Paul

This year the annual meeting of the Minnesota State Medical Association will be held conjointly with a day of clinics under the auspices of the Clinical Section of the Ramsey County Medical Society. The Thursday following the three days of the State meeting will be devoted to clinics to be given at all the St. Paul hospitals by local physicians and surgeons.

The Council will meet first Monday morning, May 17, and the House of Delegates at 2 P. M. the same day. The second meeting of the House of Delegates will be at luncheon Tuesday, May 18, at which time election of officers will take place.

The Medical Economics meeting, a successful innovation last year, will take place Monday evening, May 17. This meeting last year proved so interesting that many medical societies have flattered our Association by imitating us. The following interesting program has been arranged for the economics meeting:

Fads and Quacks—Dr. Morris Fishbein, Editor, A. M. A. Journal.

Degenerative Diseases and Periodic Health Examinations—Dr. C. P. Emerson, Dean Indiana University Medical College.

The Medical Profession and the Press—Mr. Herbert R. Galt, Managing Editor, Dispatch and Pioneer Press.

Tuesday evening, May 18, the annual banquet will be held for physicians only. Dr. J. T. Christison of St. Paul will preside and the members will be addressed by the Mayor of St. Paul, Governor Christianson, President Johnson, the newly elected president of the State Association, Dr. Charles Mayo and Dr. C. P. Emerson.

The scientific program will occupy all of Tuesday and Wednesday with joint medical and surgical sessions each morning and afternoon.

The following preliminary notice of the scientific sessions has been announced:

Recent Progress of Psychiatry—Dr. G. N. Ruhberg, St. Paul.

Psychological Hospital—Dr. S. T. Orton, Iowa City, Iowa, Prof. Psych., Iowa State Psychopathic Hospital.

Acute Laryngeal Obstruction—Dr. G. W. Adler, Winona.

Symposium on Infantile Paralysis—Dr. C. C. Chatterton, St. Paul; Dr. M. S. Henderson, Rochester; Dr. Frank Whitmore, St. Paul.

Symposium on Cardiovascular Renal Disease—Dr. H. Berglund, Minneapolis, Professor of Medicine, University of Minnesota; Dr. L. G. Rowntree, Rochester; Dr. C. P. Emerson, Indianapolis, Dean Indiana University Medical College; Dr. V. C. Hunt, Rochester.

A Consideration of Certain Features of Angina Pectoris—Dr. F. M. Smith, Iowa City, Iowa, Professor Theoretical and Practical Medicine.

Surgical Treatment of Periduodenitis—Dr. E. P. Quain, Bismarck, N. D.

Clinic on Diseases of the Thorax—Dr. W. S. Lemon and S. W. Harrington, Rochester.

Treatment of Athletic Injuries—Dr. C. W. Spears, Minneapolis.

Clinic on Gastric Diseases—Dr. Arnold Schwyzer, St. Paul

Surgery of the Infant Abdomen—Dr. A. A. Zierold, Minneapolis.

Wednesday evening, following the scientific program, an entertainment for visiting physicians and their wives will be offered by the Ramsey County Medical Society. Talented members of the local profession and their families will furnish the program, which will be followed by a dance.

Thursday will be devoted to clinics at the various St. Paul hospitals under the direction of the Ramsey County Clinic Week committee.

The Women's Auxiliary of the Minnesota State Medical Association will hold its annual meeting Tuesday afternoon for the election of officers. The officers at present are:

President—Mrs. J. T. Christison, St. Paul.

1st Vice President—Mrs. O. A. Oredson, Duluth.

2nd Vice President—Mrs. W. L. Burnap, Fergus Falls.

3rd Vice President—Mrs. J. D. Lyon, Minneapolis.

Recording Secretary—Mrs. G. K. Hagaman, St. Paul.

Corresponding Secretary—Mrs. F. C. Rodda, Minneapolis.

Treasurer—Mrs. C. L. Larsen, St. Paul.

Auditor—Mrs. Wade Humphrey, Stillwater.

Date of Annual Meeting—Tuesday afternoon, May 18, 1926.

Three vice presidents, treasurer and corresponding secretary to be elected at this meeting.

During the State Medical Meeting, the Women's Auxiliary will present the educational program for visiting doctors' wives.

Mrs. J. T. Christison, President of the State Auxiliary, is chairman of the program committee, and the executive board constitute the committee.

Ramsey County Auxiliary will act as hostess at several social functions. Mrs. E. C. Eshelby, President, and Mrs. Henry Klein, chairman of the entertainment committee, are in charge of the arrangements.

The following committees have been appointed:

Membership—Mrs. E. C. Eshelby, St. Paul.

Legislative—Mrs. Woodard Colby, St. Paul.

Publicity—Mrs. Sherman S. Hesselgrave, St. Paul.

During the convention the Women's Auxiliary will present an educational program for the visiting doctors' wives.

The Ramsey County Women's Auxiliary will act as hostesses at several social functions. Mrs. E. C. Eshelby is this year's president of the local auxiliary and Mrs. Henry Klein, chairman of the entertainment committee. Mrs. Eshelby is chairman of the membership committee, Mrs. Woodard Colby of the legislative committee and Mrs. Sherman S. Hesselgrave of the publicity committee of the local chapter.

The annual meeting and luncheon of the Minnesota Medical Alumni will be held Wednesday noon, May 19.

Among the interesting exhibits which will be made at the meeting are the following:

Drs. E. T. Bell and B. J. Clawson, Department of Pathol-

ogy, will show their recent work on experimental chronic and embolic glomerulonephritis. In addition they will have a display of hearts showing various types of valvular and muscular disease. Microscopic sections and drawings will be exhibited.

Dr. Gordon B. New of the Mayo Clinic will demonstrate laryngeal specimens removed for cancer. The demonstration will be in charge of Dr. Waltman Walters.

Dr. T. B. Magath will show a moving picture film of human intestinal parasites.

Dr. Hilding Berglund, Professor of Medicine, University of Minnesota, will give a demonstration of laboratory and bedside methods for blood sugar determination. Colorimeters will be on display and a demonstrator will be in charge.

Dr. W. P. Larson has consented to give a demonstration of his work on diphtheria, scarlet fever and tetanus toxins. By the admixture of soap these toxins are rendered harmless, and immunization results in apparently as great a number of instances and in a much shorter space of time than by the usual method. In addition, serum sensitization is avoided. This method has been in use for some time and its value is apparently established. He will show animals injected with pure toxin and other animals injected with toxin-soap combinations.

A list of the officers and committees on arrangements for the joint meetings of the Minnesota State Medical Association Convention and the Ramsey County Clinic Week:

President—Dr. C. C. Chatterton.
Vice President—Dr. F. J. Savage.
Secretary—Dr. A. G. Schulze.
General Chairman—Dr. George Earl.
General Secretary—Dr. Warner Ogden.
Banquet Committee—Dr. J. T. Christison, chairman; Drs. C. N. McCloud, W. R. McCarthy.
Civic Clubs—Dr. H. O. Skinner, chairman; Drs. J. F. Borg, H. H. Wolfe.
Clinical Material—Dr. E. M. Hammes, chairman.
Convention Hall—Dr. Donald Bacon, chairman; Drs. C. C. Bell, H. E. Richardson, Frank Whitmore.
Entertainment—Dr. A. E. Comstock, chairman; Drs. Geo. A. Geist, W. C. Rutherford.
Exhibits—Dr. T. J. Maloney, chairman; Drs. W. R. McCarthy, Edw. Schons.
Hospital Clinics—Dr. F. C. Schuldt, chairman; Drs. W. C. Carroll, E. H. Norris, H. B. Zimmerman, P. H. Kelly, L. A. Hilger, E. J. Engberg, A. W. Ide, O. W. Sterner, E. O. Giere.
Ladies—Mrs. E. C. Eshelby, chairman.
Publicity—Dr. E. A. Meyerding, chairman; Drs. R. A. Bock, J. E. Fulton.
Reception—Dr. A. P. Gruenhagen, chairman; Drs. H. E. Binger, W. Ray Shannon.
Reunions—Dr. C. N. McCloud, chairman; Dr. John M. Culligan.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

The Executive Committee of the Southern Minnesota Medical Association has announced that the regular annual meeting will be held October 18, 1926, instead of in the spring of the year as heretofore. Mankato has been chosen as the place of meeting.

OF GENERAL INTEREST

Dr. Owen W. Parker of the Shipman Hospital staff, Ely, Minn., has returned from a visit to Chicago, New York and Washington.

Dr. Herbert Boysen, who has been located at Truman, Minnesota, is now practicing his profession at Welcome, Minnesota.

Dr. W. B. Richards of St. Cloud has announced the opening of offices in Suite 303, St. Mary's Building, with practice limited to obstetrics, infant feeding and diseases of children.

The annual address delivered before the Minnesota Pathological Society was given this year by Dr. F. C. Mann of Rochester on the subject, "The Site of Formation and Origin of Bile Pigment," at the meeting held March 16 in the Institute of Anatomy, University of Minnesota.

Dr. Willis Campbell of Memphis, Tennessee, will speak under the auspices of the Minnesota Orthopedic Club on the subject of "The Mobilization of Stiff Joints," in the Anatomy amphitheater of the University of Minnesota at 8 P. M., April 6, 1926. The address will be illustrated by animals, cartoons and motion pictures. All physicians are cordially invited.

Emory University, at Atlanta, Georgia, announces the launching of a $4,500,000 endowment and building program for its medical school (formerly the Atlanta Medical College) and hospital (the Wesley Memorial Hospital). The support of the medical profession is solicited. The $10,000,000 expansion campaign now under way will provide for all schools of the University, which are as follows: the College of Liberal Arts, the School of Medicine, the Graduate School, the School of Business Administration, the School of Law, and the School of Theology.

The American Board of Otolaryngology has arranged for two examinations during the month of April, as follows:

St. Paul's Sanitarium, Dallas, Texas, Monday, April 19, at 9 A. M.

Stanford University Medical School, Clay and Webster Streets, San Francisco, California, Tuesday, April 27, at 9 A. M.

Applications may be secured from the Secretary, Dr. H. W. Loeb, 1402 South Grand Boulevard, St. Louis, Missouri.

The Board of Directors of the Hennepin County Public Health Association has unanimously invited Dr. Richard Olding Beard, who recently retired from active teaching service at the University, to take the Field Secretaryship of the Association upon a part-time basis.

Dr. Beard has accepted the appointment, with the understanding that he will continue to devote a major part of his time to the direction of the Committee on Endowment and Building Funds of the Medical School of the University. He is Chairman and General Secretary of this Committee and has been initially responsible for the promotion of its work since its appointment.

STATE HEALTH DEPARTMENT

COUNTY SOCIETIES TO CONDUCT CAMPAIGN AGAINST DIPHTHERIA

The last issue of MINNESOTA MEDICINE announced that the State Health Department will supply diphtheria toxin-antitoxin and material for the Schick test free of charge.

The diphtheria statistics for 1925 are now available. The mortality rate per 100,000 population from diphtheria in Minnesota was 9.01. This is about the same as the 1921 rate (9.03), but higher than the rates for 1922 (7.74), 1923 (8.40), 1924 (8.61). There were 3,778 cases reported and 231 deaths, with a fatality of 6.1 per 100 cases in 1925. This exceeds the fatality rates of 1921 (5.0), 1922 (4.5), 1923 (4.7), and 1924 (5.8). Minneapolis reported 1,717 cases with 108 deaths; St. Paul, 805 cases with 32 deaths; Duluth, 21 cases and no deaths. Duluth's record is a remarkable one for a city of 110,000. Exclusive of these cities, 1,235 cases with 91 deaths were reported. The ages of the fatal cases in 1925 were—

	Deaths
Under 5 years	77
5 - 9	79
10 - 14	30
15 - 19	10
20 or older	35

These figures show that the physician in general practice has a greater opportunity to do effective work in the prevention of sickness and for the saving of the lives of children by using toxin-antitoxin for immunization against diphtheria than the health officer. Therefore, the State Board of Health feels that each County and District Society should take the initiative and in co-operation with the boards of health and the boards of education of the counties, cities and villages should formulate plans for the systematic use of toxin-antitoxin among children of pre-school age and in the public and parochial schools throughout Minnesota. Dr. Herman Johnson, president of the State Medical Association, suggests that doctors protect their own children first.

The State Department of Health will loan moving picture films furnished by the Metropolitan Life Insurance Co. and by the John Hancock Mutual Life Insurance Co., upon request, but the express charges for the films must be paid by the locality. Exceedingly attractive and interesting pamphlets about diphtheria may be obtained free of charge from the Metropolitan Life Ins. Co., New York City, or from the John Hancock Mutual Life Ins. Co., Boston, Mass., on request to the Home Offices, or through the district managers of these companies in Minnesota. The State Board of Health approves of the use of these pamphlets by local health authorities.

The State Department of Health will supply free of charge by mail on request of any physician the following material for diphtheria immunization: Toxin-antitoxin in 30 c.c. vials, or 10 c.c. vials, and when required by special circumstances the individual packages of three vials of 1 c.c. each.

Record cards providing for the signed request of parent or guardian for inoculation of the child and for record of the three toxin-antitoxin injections and of the Schick test, will be supplied, also.

It is very important that all records of all toxin-antitoxin treatments and the subsequent Schick test be filed where they may be accessible for future reference. Suitable arrangments will be made in each community for the keeping of permanent files of toxin-antitoxin records.

Requests for toxin-antitoxin and Schick test material should be addressed to the State Department of Health, Old Capitol, St. Paul, Minn.

ERRATUM

In the report of the annual meeting of the Rice County Medical Society published in the February issue of MINNESOTA MEDICINE, an error was made in the name of the compensation adjustor for the Minnesota Industrial Commission. The name should have appeared as Mr. Hugo Koch.

NEW AND NON-OFFICIAL REMEDIES

PROPAGANDA FOR REFORM

Antistreptococcus Serum.—For some years the Council has been questioning the value of antistreptococcus serums. These products have been retained in New and Non-official Remedies with the caution that on the basis of clinical reports there is perhaps justification for the use of the serum in streptococcus infections, but that there is no scientific basis for it. In consideration of a report prepared by Dr. Emil Novak on the basis of a questionnaire sent to a number of surgeons, gynecologists and obstetricians, the Council voted to retain antistreptococcus serum preparations in New and Non-official Remedies provisionally. (Jour. A. M. A., Feb. 6, 1926, p. 417.)

Sanocrysin.—In spite of the disappointing results from the use of "Sanocrysin" in animal tuberculosis in the careful experiments carried out for the Hygienic Laboratory by Theobald Smith, Wm. H. Park and E. C. Schroeder, it is possible that some renewal of interest may arise as a result of recent papers by European physicians on the use of sodium-gold thiosulphate in human cases of tuberculosis. One naturally views with doubt the value of these reports, since these physicians have discarded the theories originally advanced and, to a large extent, also, the use of the antitoxic serum. They thus place the substance in the category of the gold salts used in the therapy of tuberculosis with which a long record of varied experiences is available. It is possible that the use of gold may have some value, but there is no evidence at hand today; hence the wisdom of American physicians in awaiting definite proof of action in animal tuberculosis before using it in the human disease will save much suffering and distress. (Jour. A. M. A., Feb. 13, 1926, p. 487.)

National Health Service. — Some time ago the United States Public Health Service issued a warning that the "National Health Service," Washington, D. C., was attempting to capitalize the research work done by the United States government and to confuse the public into believing that it was in some way identified with the Public Health Service of the government. The offices of the National

Health Service are no longer in Washington, D. C., but in New York City. The concern is either operated from two addresses—17 West Sixtieth Street and 70 Fifth Avenue—or there are two concerns of the same name. From the first address a so-called "Book of Health," a urinalysis "health service" and a line of fad foods are sold. From the Fifth Avenue address letters are sent to industrial concerns urging them to purchase "a remarkable discovery for kidney disease, which has produced unbelievable results even in extreme cases where all other means have failed." An analysis of Rensano made in the A. M. A. Chemical Laboratory confirmed by pharmacologic tests carried out at the University of Illinois showed that Rensano is essentially milk sugar with a minute amount of alcohol. This inert and therapeutically worthless product is exploited to individuals and industrial plants with the suggestion that working men suffering from such serious conditions as nephritis and diabetes should be given this product in lieu of medical attention. (Jour. A. M. A., Feb. 13, 1926, p. 502.)

Formaldehyde Fumigators.—The term "solidified formaldehyde" is used loosely, sometimes denoting dry paraformaldehyde but more generally denoting a solidified mass of soap, tallow, or such substance with formaldehyde. When paraformaldehyde is heated, formaldehyde and some sublimed paraformaldehyde are given off. The amount of formaldehyde yielded depends on a number of conditions. In the case of solidified formaldehyde, the concentration of the formaldehyde and the amount of vapor evolved must be known to judge its efficiency. Fumigation as a means of preventing the spread of disease is regarded as far less important than formerly. (Jour. A. M. A., Feb. 13, 1926, p. 505.)

Acacia and Intravenous Injections.—The harmfulness of acacia in the treatment of shock and hemorrhage has been pointed out repeatedly. The changes resulting from the use of this otherwise inert agent bear on the many sided question of intravenous therapy. The investigations of Hanzlik have shown the wide changes which occur in the blood and tissues. Confirmatory of the work of Hanzlik, it was found that the blood after injection of acacia is definitely altered. The danger of intravenous injection of acacia has been fully demonstrated. The warning against acacia may be extended to other blood substitutes and, in fact, to intravenous injections in general. (Jour. A. M. A., Feb. 20, 1926, p. 556.)

Administration of Mercury and Arsphenamine.—The arsphenamines are so reactive that they may not be combined in solutions with mercury salts for intravenous administration. Alternation of drugs, rather than simultaneous administration, is the present trend of antisyphilitic medication. Mercury compounds administered intravenously should be given more frequently and over a longer time than is permissible for the administration of arsphenamine in sufficiently large doses. Furthermore, it is generally advisable not to give intravenous mercury medication, but to employ the forms such as the insoluble salts (or certain soluble salts) intramuscularly or to apply inunctions. (Jour. A. M. A., Feb. 20, 1926, p. 572.)

Pertussin.—The reason the medical profession should refuse to prescribe Pertussin is not primarily because the stuff is advertised to the public, but that it is a product of indefinite composition, marketed under a non-descriptive, therapeutically suggestive name, and is exploited with misleading claims. Pertussin is one of many proprietaries which has been popularized through the uncritical testimonials given the physician. (Jour. A. M. A., Feb. 20, 1926, p. 573.)

Glucose-Dextrose.—Legislation now under consideration in Congress aims to modify the interpretation of the Federal Food and Drugs Act so that food products shall not be deemed adulterated or misbranded "because of having been preserved or sweetened with an article commonly known as corn sugar, also with an article known as fruit sugar or levulose." From the standpoint of nutrition and health, no reasonable objection can be offered to this proposal. It should be emphasized that in the new pharmacopeia "glucose" connotes the syrupy substance; the pure substance such as is used for treatment of hyperglycemia following a large dose of insulin is now described under the name dextrose (sometimes called d-glucose; formerly described also under the name anhydrous glucose). This may lead to confusion, as many physicians still speak of "glucose" injections, which under the new pharmacopeia are really "dextrose" injections. (Jour. A. M. A., Feb. 27, 1926, p. 628.)

Cod Liver Oil Emulsions.—As a short period of aeration at a low temperature does not lead to destruction of either vitamin A or vitamin D (the antirachitic vitamin) it is safe to say that emulsified cod liver oil is equal in vitamin potency to the unemulsified.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of January 13, 1926

The Minnesota Academy of Medicine held its regular monthly meeting at the Town and Country Club on Wednesday evening, January 12, 1926, at 8 o'clock. There were 35 members and 2 visitors present.

The meeting was called to order by the President, Dr. H. L. Ulrich.

Upon ballot the following men were elected to Associate Membership in the Academy:

Dr. H. F. Helmholz, Rochester.
Dr. Donald C. Balfour, Rochester.
Dr. H. Z. Giffin, Rochester.

Dr. Arnold Schwyzer (St. Paul) reported a case.

Dr. F. R. Wright (Minneapolis) read a paper entitled "Suprapubic Cystotomy."

DISCUSSION

Dr. Gilbert Thomas: I think Dr. Wright has covered the subject very thoroughly. The historical part of his paper is very interesting and I am glad to know that history reveals that urology has been a specialty for many hundreds of years. When one attempts to do a suprapubic cystotomy, in spite of the greatest care, the peritoneum is occasionally opened. This occurs not only when cutting, but when the peritoneum is packed away too roughly. This

is not a serious complication to suprapubic cystotomy providing the peritoneum is quickly repaired.

Dr. Wright: The reason why I sew the bladder to the aponeurosis is because if you use a plain drainage tube it is easily displaced and it is almost impossible to replace it if the bladder is not attached to the abdominal wall. If the bladder is attached, however, and the tube comes out it can be replaced without difficulty. The bladder can easily be detached and replaced in the abdomen after the drainage is taken out by the use of either local anesthetic or H.M.C. anesthetic.

Dr. Wm. F. Braasch (Rochester) read a paper, and showed a number of lantern slides, on "Ureteral Obstruction."

DISCUSSION

Dr. S. M. White: In the clinic, with the fullest co-operation between the internist and the urologist, we have been able to study a very considerable number of these individuals complaining of abdominal and back pains, and attempt a solution of their problem. Some of them do have genuine ureteral disorders such as accompany pyelitis, pyelocystitis, ureteral calculus, etc., but we would demand more evidence than a "hang" with a wax bulb bougie before accepting the diagnosis of ureteral stricture. It is difficult for me to conceive of stricture without evidence of real dilatation above it. Much more work by many trained men is needed. Dr. Braasch takes a very sound attitude in this connection. I heard Dr. Hunner's paper and was greatly interested in the subject, but think the time is not yet ripe to accept his conclusions in toto. The significance of a hang with the bougie, so far as it indicates stricture, can and will be solved with enough careful work such as that reported by Dr. Braasch. We certainly do not want to replace chronic appendicitis, the standby of the hasty diagnostician, with a new easy and quick refuge in the ureteral field.

Dr. A. R. Colvin: There seems to be a good deal of doubt about the existence of the ureteral strictures which Dr. Hunner describes. Since finding a stricture of the ureter (postmortem) due to a very small localized tuberculous lesion of the ureter, I have wondered if it is not possible to have a stricture of the ureter due to localized infection of another character.

Regarding the dilated ureter without stricture, before the days of pyelography, I operated on a young man 25 or 26 years of age, who had very definite attacks of renal colic, and not being able to find anything in the kidney I examined the ureter and did find a greatly dilated ureter. I opened the ureter and passed quite a large rubber catheter down into the bladder and demonstrated the fact that he had no stricture. I wonder whether that conforms to the type Dr. Braasch spoke of as atony.

Dr. Gilbert Thomas: I have been tremendously interested in ureteral stricture. All urologists have to be interested in this subject whether they want to or not because it is being discussed so frequently in the literature. About two years ago I decided to try to find out how often ureteral stricture exists and if I could make a diagnosis when it did exist. First we tried wax bulbs during a great many examinations of both males and females. We did not get very far because the majority of patients had some "hang" with the bulb, which upon further examination did not prove to be a stricture. We did not accomplish much with this clinical examination, so that I tried to get some postmortem material. With the help of the Department of Pathology of the University of Minnesota, I was permitted to examine material from about 200 autopsies. Most of the autopsy material is drawn from the Twin Cities or the near neighborhood, so that I was sure, if I missed the diagnosis of stricture during the clinical examination, that a reasonable percentage should appear in the autopsy findings. I examined both kidneys, both ureters, and that section of the bladder where the ureters empty into it. As soon as possible following the autopsy I used wax bulbs and measured the ureteral diameter, and in only one instance did we find a ureteral stricture and that was unilateral. In addition to passing wax bulbs and measuring the ureter, pyelo-ureterograms were made in every instance.

Recently I saw a postmortem specimen at the University Hospital which had dilated ureters on both sides. I am of the opinion that this is a congenital affair. The bladder section of the ureter in this case was not obstructed or narrowed so that there was no mechanical reason for the large ureters.

It is rather difficult, when reading a pyelogram, to tell whether or not the ureter is dilated. I think that when a stricture is present one should always be able to demonstrate dilatation above.

If one introduces novocain into the ureter, one can frequently, by repeating the pyelogram, show that the supposed stricture was nothing more than spasm. This indicates to me that spasm accounts for the largest number of so-called strictures.

I would like Dr. Braasch to mention, in closing his discussion, any reason for the widening of the ureter that is so frequently seen just as the ureter enters the pelvis. This occurs in normal ureters very frequently.

Dr. F. R. Wright: My experience in this line of work has been decidedly limited. I had one peculiar experience: a woman who complained of pain in her left side. When I passed a catheter into her ureter the pain disappeared and has not returned. Her urine at all times was normal. I cannot conceive that this was due to stricture. The ureter is a very narrow organ. One stretching by passing a catheter will not cure or remove a stricture. If we pass a filiform bougie through a narrow stricture in the urethra the mucous membrane will swell and the patient may have an increased trouble for 24 or 48 hours. The men who report these ureteral strictures never report any later trouble. The patient is always relieved from pain. I do not believe it is due to stricture. It must be a spasm. It is barely possible that the passage of the bulb into the ureter can produce a spasm which can be felt. There is no reason to suppose that the catheter may not produce spasm the same as a bulb.

Dr. H. L. Ulrich: I would like to ask Dr. Braasch about the intrinsic nerves of the ureters. The heart and the intestines all have intrinsic nerves which are connected with the spinal nervous system. Are the ureters connected to the splanchnic nerve in the pelvis? Is there not some central control?

DR. BRAASCH (in closing): I am going to answer the last question first. It is well known that the heart, when removed from the body, will continue to beat for a long time; and, similarly, the ureter has an intrinsic nervous mechanism which has no relation to the central system. Dr. Colvin's question is answered by the fact that neither he nor any other pathologist has ever observed a pathological condition in the ureter which would correspond to Dr. Hunner's stricture. Several years ago I asked our Dr. Robertson to be on the lookout for this type of stricture and if he ever found one to call me at once, but he has not done so yet. The weakness of Dr. Hunner's stricture theory is that no pathologist has ever demonstrated the condition that he described clinically. Therefore one cannot help but think that the cause of the so-called "hang" is a spasmodic condition of the ureter and not actual constriction. On the other hand, it may be difficult to demonstrate actual spasm of the ureter. I am sorry that there are not some of the adherents of Dr. Hunner's theories here to defend him. They could demonstrate, to their own satisfaction at least, that there was a stricture present.

As a result of the stricture theory, hundreds of patients are being treated for stricture who, I fear, have none. It is open to question whether many of them would not have just as much relief from massage, diathermy, or psychological treatment.

I am unable to explain the fusiform dilatation of the ureter in its pelvic portion, which Dr. Thomas asked about. The last word has not been said on this subject and I hope that my remarks will stimulate to farther investigation of the cause of this condition.

The meeting adjourned.

JOHN E. HYNES, M.D.,
Secretary.

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

PULMONARY ACTINOMYCOSIS

REPORT OF A CASE

WILLIS S. LEMON, M.D.
Division of Medicine, Mayo Clinic
Rochester, Minnesota

A Bohemian, aged forty-six years, coming from Montana, presented himself at the Mayo Clinic for examination February 10, 1925. He complained particularly of discharging abscesses of the chest wall. The history of the illness began with acute symptoms which necessitated drainage for empyema in July, 1924. The onset had been sudden and characterized by severe pain in the right side of the chest accentuated by inspiration. The illness was so severe that it was necessary for him to be sent to the hospital and to have morphin administered for the pain. During the early days of his illness, there was some uncertainty with regard to the degree of fever, although the patient is sure that he had some elevation of temperature. However, there was no complaint of cough, and within eight days his recovery seemed to be complete. Within a few days subsequent to his dismissal, however, he felt ill; his temperature varied from 100 to 102°, and cough appeared. At first the cough was dry and irritating in character, but it soon became productive of mucopurulent sputum stained occasionally by small amounts of blood. Suddenly during this illness he coughed up as much as 250 c.c. of pus at one time. He was again sent to the hospital and, after five days, empyema was diagnosed and an operation for drainage performed. He was kept in the hospital for seven weeks, but finally recovered satisfactorily, although the drainage from the wound had not completely ceased. The temperature, however, was normal; he gained weight satisfactorily, and the discharge was so slight that the wound required dressings only twice a day. Because of the chronicity of the discharge, the wound was probed with instruments and almost immediately afterward he began to fail in health. Fever appeared and he suffered from loss of strength and weight. A large abscess formed under the right arm which required incision and drainage during the latter part of November. Finally, there were four draining sinuses, scattered over the right side of the chest; in December the cough was productive of at least 125 c.c. of pus daily. Bismuth paste was injected each day for a month, but at every injection the cough became severe and paroxysmal, and was productive of not only pus, but of the injected material. Because of the immediate production of cough and the expectoration of bismuth, it would seem that the fistula leading to the bronchus must have been a short and straight one rather than a long and tortuous channel.

At the time the patient appeared at the clinic, he had a large subcutaneous abscess of the right upper portion of the front of the chest, the center of which was in the midclavicular line. Four sinuses were seen high in the axilla and toward the back near the angle of the scapula. The whole side was immobile with marked dullness on percussion posteriorly. The temperature was 100.4°, pulse 108, and blood pressure 102 systolic and 80 diastolic. The weight was 163 pounds, which represented a loss of 22 pounds.

The primary diagnosis was chronic empyema, with multiple fistulas and empyema necessitatis. Bronchial fistulas were known to be present from the history, and the condition was thought to be due to tuberculosis or actinomycosis, but malignant disease of the lung and pleura was considered as a possibility. Empyema necessitatis was considered possible because of the situation of the abscess. It has been observed that, when empyema ruptures through the chest wall, it does so at the point where the wall is thinnest, namely, in the midclavicular line or in the axillary region. After the patient's admission to the hospital, a diagnosis of actinomycosis was made by the recognition of sulphur bodies in the drainage material. During his stay in the hospital, his temperature varied from normal to 99.5°, and when his condition became satisfactory, the abscesses were incised and drained, and the sinuses curet-

ted. The diagnosis was confirmed at the time of operation. The large subcutaneous abscess contained from 240 to 300 c.c. of thick yellow pus in which sulphur bodies were plentiful. The primary reaction to operation was fairly satisfactory, although the temperature rose to 101.3°. It gradually fell for the next three days and then became normal. The pulse varied from normal to 110, and then after a few days reached an average of 80. His respirations varied from 20 to 24. He remained in the hospital until March 24, when he was dismissed on treatment, consisting of the administration of a saturated solution of potassium iodid which was started at a very low dosage of 10 grains three times a day. The daily dosage was increased, however, by 3 minims. Tonics and Blaud's pills were used because of the appearance of secondary anemia. Five radium treatments were given, a total of 5,700 mg.-hours. These were supplemented by a course of roentgenologic treatment anteroposteriorly. Morphin and codein were used when necessary to control the pain. During the patient's stay in the hospital, the hemoglobin was reduced to 40 per cent; the erythrocytes numbered 3,360,000, and the leukocytes averaged from 10,000 to 12,000, a rather low figure in this disease when the viscera are involved. The sputum was markedly reduced by treatment, so that only 60 c.c. was expectorated daily, but Actinomyces was found in the sputum.

From the time of the patient's dismissal until his readmission, contact was maintained through correspondence. While he was at home, he took large doses of potassium iodid. He had been informed that he should discontinue the treatment should gastric symptoms occur, and that further irradiation should be undertaken after three months. Within a month following dismissal, he was suffering so severely from pains in the chest that he was again admitted to the hospital, the pain becoming so severe as to call for morphin daily for the next three months. During this time, he lost the use of his right arm as a result of pain and contracture due to scarring from the incision of the abscesses in the axilla. In October, 1925, he was treated elsewhere, and it was found necessary to give further roentgenologic treatments and to reoperate for the improvement of drainage. All the wounds closed except the large subcutaneous abscess that had been opened at the clinic and the patient returned again to normal health.

As is characteristic of actinomycosis, however, there was recurrence of infection initiated by severe chills, pain, and increased drainage from reopening the sinuses. The discharge was similar to that of the early part of the illness, except that it had become less purulent and more watery in character, although it still remained blood-tinged. In November, he was taking 160 minims of potassium iodid solution each day.

The patient was readmitted to the clinic December 19. At this time the blood pressure was 103 systolic and 64 diastolic, the pulse 116, and the temperature normal. Many sinuses were found on the chest wall which drained serosanguineous and purulent material. Breath sounds could be obtained on the right side only, over the upper half of the lung, and fibrosis was evidenced by the displacement of the heart to the affected side. The chronicity of the suppurative disease of the lung was shown by marked clubbing of the fingers. He was unable to lift the right arm from the body on account of axillary scarring. Again the discharge contained sulphur bodies, and they could be obtained from the sputum as well, although they had not been present in the sputum for six months previously. The hemoglobin was 75 per cent; the erythrocytes numbered 4,080,000, and the leukocytes 7,200. Dense consolidation of the lower right lobe with marked fibrosis became apparent in the skiagram. Incision of the abscesses was again undertaken to provide better drainage of subcutaneous pockets that were being improperly drained through various communicating sinuses. Radium was again used on four occasions to a total of 1,200 mg.-hours.

DISCUSSION

Actinomycosis as a disease in man has been recognized for nearly fifty years, but has always been considered to be a very rare infection. At the Mayo Clinic, on the contrary, there are records of 160 cases, of which New, in 1923, reported 107 affecting the head and neck. New and Figi reported cases affecting the tongue alone, while Brogden reported twenty-two affecting the abdomen, and Moersch reported three affecting the central nervous system. In 1923, Sanford and Voelker attempted to collect records of all the cases that had appeared within the United States. They were able to study the records of 700 cases. From this report, it appears that actinomycosis is distributed throughout the United States, but that the states in the upper Mississippi Valley and in the northwestern portion of the United States produce the largest percentage of cases. Owing to the careful registration in a number of eastern states, however, Massachusetts leads in the number reported; New York is second, Illinois third, Minnesota fourth, Wisconsin fifth, Iowa sixth, South Dakota seventh, and Montana eighth.

The nature and site of the disease.—The infection has been noted in almost all areas of the body, including the tongue, head and neck, bronchus, esophagus, mediastinum, chest wall, lung, diaphragm, central nervous system, abdomen, appendix, duodenum, liver, ovaries and extremities. In the Mayo Clinic the disease has not been seen in the lacrymal ducts, as described by Poncet and Bérard.

Age and sex.—Males predominated, and in the complete series, as described by Sanford, they were 80 per cent of the total number. Most of the patients were between twenty and forty years, although the patient whose case I have reported was forty-six years of age. There are records of cases in the two extremes of life and one instance of a child aged only twenty-eight days who was found at necropsy to have an abscess of the lung in which Actinomyces was discovered. In one case reported by Ahrens the patient was eighty-two years old and finally died from actinomycosis of the chest after an illness of ten years.

Duration.—Two types of infection have been noted in the Mayo Clinic: acute and chronic, the former lasting only a few months and the latter continuing for many years. In one case reported by Vinson and Sutherland, in which there were multiple areas of infection, one of which had produced a bronchoesophageal fistula, the disease had lasted twenty-eight years. Two other cases of the disease were observed which affected mainly the framework of the

body and subcutaneous tissues, in which the duration had been ten and fifteen years, respectively. All three of these patients are still in fairly good health.

Route of infection.—The thoracic type of case, such as reported here, constitutes about 14 or 15 per cent of all infections with actinomycosis. This percentage is fairly uniform and accords with the experience of various authors. From 60 to 70 per cent of the infections are in the head and neck. In 1925, Torek reported a similar instance of disease affecting the lung and chest in a man forty-two years old. He raised a question as to the cause of the infection in the lung and thought that the disease might be primary there. He admitted that the lung might be infected secondarily to the disease within the neck, from which location it might extend along the great vessels to the skull, meninges and brain, or downward along the spinal column in the shape of a perivertebral phlegmon causing caries of the vertebræ, suppuration of the costovertebral joints, and extension through the posterior mediastinum to the pleura and lung. I have, however, never seen the disease affecting bone. Torek finally came to the conclusion in his own case that the disease was primary in the lung with multiple foci of granulation tissue which broke down into abscesses. Some of these abscesses perforated into the bronchi causing hemoptysis; others perforated the pleura at the apex forming an abscess of the neck, while still others involved the pleura, breaking through it. When actinomycosis is primary in the lung it makes steady progress through the organ, without respect of tissue, invades the pleura, and causes adhesions so that, before penetrating the chest wall, the focus of empyema itself almost invariably covers a small area and contains only a small amount of purulent material. In the case reported here the bronchi had been invaded and a bronchial fistula established.

Prognosis.—The prognosis when the disease attacks the internal organs is not favorable even though the course may be a very chronic one. Patients usually succumb to exhaustion due partly to drainage and partly, perhaps, to amyloid degeneration of other organs. The patient under discussion has improved greatly, but is far from being well, and the disease may recur in the future. Treatment consists in the use of large doses of potassium iodid and the employment of irradiation with roentgen rays and radium.

CHOREA OF PREGNANCY*

REPORT OF CASE

MARTIN S. SICHEL, M.D.
Minneapolis

A. F., aged 27, married, primipara, was first seen when admitted to the Minneapolis General Hospital on September 26, 1925. She had had scarlet fever six years before and one attack of chorea three years ago lasting three weeks, from which she fully recovered. Until a few days prior to her admission her health had otherwise been good.

Her menstruation had always been normal; she last menstruated in March, 1925. Five days prior to admission, the patient began to be very irritable and nervous; this was followed by the development of choreiform movements mainly on the left side involving both the upper and lower extremities, convulsive opening and closing of the mouth, and a nervous irritability characterized by quick emotional changes such as crying and fear.

Physical examination showed a well nourished young woman, weight 140 pounds. The eyes showed a constant nystagmus and the pupils reacted to light and accommodation. The mouth showed a constant twitching; teeth were fairly good; tonsils were enlarged and seemed a possible focus of infection. The neck was negative. The heart and lungs were essentially negative, there being no indication of any cardiac valvular disease or damage to the heart from her previous illnesses. The abdomen showed an enlargement of the uterus reaching to one finger above the umbilicus. It was estimated that at this time the patient was about six months pregnant. Vaginal examination was negative except to further bear out the fact of the pregnant condition. The left leg and left arm were the seat of constant chorciform movements and twitchings. The reflexes were all slightly increased, but equal on both sides, and no pathological reflexes were present.

On admission the temperature was 98 F., the pulse 90, the respirations 20, and the blood pressure was 125/85. The urine was normal. The blood picture showed: hemoglobin, 80 per cent; red blood cells, 5,200,000; white blood cells, 14,600; polymorphonuclears, 85 per cent; lymphocytes, 14 per cent, and large mononuclears, 1 per cent.

The Wassermann test was negative; vaginal smears were negative; the blood culture was negative; and the blood chemistry was normal. A diagnosis of chorea of the Sydenham type complicating pregnancy was made.

During the first week she was kept in bed and given bromides, chloral, luminal, morphine, hyoscin, and Fowler's solution, but the course was a steady downhill one with the patient gradually reaching a maniacal stage necessitating restraints. The temperature remained normal and the pulse varied between 100 and 120. She was very easily irritated and refused to co-operate. It became necessary to feed her.

At this time the possible induction of premature labor was considered in order to save the patient's life, but before resorting to this it was thought advisable to try the intravenous injection of blood serum obtained from a normal pregnant woman. Accordingly, 15 c.c. of blood serum was given intravenously on four successive days. This was followed almost immediately by a marked improvement so that the restraints could be removed and the patient became rational and was able to take nourishment. Two weeks later she was again given 20 c.c. of blood serum on four successive days, this time followed by very marked improvement clinically. She remained in the hospital eight weeks in all, being discharged on November 21, 1925, with practically no signs of any muscular twitching and no apparent mental defect. The splendid result obtained in this case was attributed entirely to the intravenous use of the blood serum.

She was then followed in the out-patient department, returning to the hospital on December 31, 1925, in labor.

*From the Obstetric and Gynecological Service, Division B, of the Minneapolis General Hospital.

A normal labor ensued, ending in the spontaneous delivery of a healthy, normal, full term female child weighing 7 pounds 10 ounces. The patient remained in the hospital ten days, where she went through a normal postpartum period, the mother and baby both being discharged in good condition.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SURGERY

SUPERVISORS:
DONALD K. BACON,
LOWRY BLDG., ST. PAUL
VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

EXPERIMENTAL NEPHROTOMIES: Wm. James Carson (S. G. & O., 1926, 42; 1, p. 53). Moore and Corbett studied experimentally the damage done to the kidney by operation. They concluded, in part, that (1) an operation on the kidney always destroys a certain amount of kidney substance, the section itself doing less harm than the sutures; (2) the destruction of the kidney extends far beyond the site of the operation and can be demonstrated histologically. Magoun showed reduced function in 14 out of 26 experimental nephrotomies.

The author's experiments were undertaken in an effort to secure a method of suturing that would result in a minimal of kidney damage.

Method of Experimentation: Dogs were used. The kidney was delivered and incised from pole to pole down to the pelvis in the midline. The bleeding surfaces were sponged, approximated and held together by light pressure, while interrupted Cushing sutures were introduced into the capsule, without injuring the kidney substance.

Results: In 24 out of 25 dogs no blood was noted in the urine after 4 days; hemorrhage occurred in one instance. Examination of these kidneys after from 4 to 266 days showed the maximal width of the scar to be 4 mm., and histologically there was a minimum destruction of the kidney substance.

H. E. Simon, M.D.

WHY DOES NOT THE THORACIC SURGEON CURE CANCER OF THE ESOPHAGUS? Chevalier Jackson (Archives of Surgery, 1926, 12, p. 236). Cancer of the esophagus is exceeded in frequency only by uterine, mammary and gastric cancer. It is a mild, slow, and for a long time purely local process.—ideal conditions for surgical cure, yet little progress has been made toward this end.

The author blames the lack of early diagnoses largely on the fact that the diagnostic criteria taught in our text books are symptoms and signs resulting from obstruction and necessarily appearing very late in the disease. The blind passage of a bougie is only an inferential method at best and is negative in all except late cases.

An early diagnosis of cancer in the esophagus can be made with the same degree of certainty as on the cervix. There are only two methods by which the diagnosis can be made early and positively:

(1) *X*-ray, which is rarely erroneous in the hands of an experienced roentgenologist.

(2) Esophagoscopy, while a highly technical procedure, permits of very early diagnosis and makes possible the taking of tissue for microscopical examination.

There is good reason for believing that when the day shall have arrived when every patient with supposed "globus hystericus" or with the slightest subjective abnormality in swallowing is promptly examined with the esophagoscope, the thoracic surgeon will show a good percentage of cures.

H. E. Simon, M.D.

ROENTGENOLOGY

SUPERVISORS:
LEO G. RIGLER,
MPLS. GEN'L HOSPITAL, MINNEAPOLIS
A. U. DESJARDINS,
MAYO CLINIC, ROCHESTER

THE CLINICAL AND ROENTGEN DIAGNOSIS OF DUODENO-COLONIC FISTULA: Kohlmann (Fort. a. d. Geb. d. Röntgen., V. 33, p. 554, June, 1925). Both duodeno-colonic and gastro-colonic fistulæ are relatively rare. They can be readily recognized roentgenologically by the rapid passage of the barium meal from the duodenum or stomach into the colon. A portion of the meal may then pass into the small intestine. Occasionally a residue of barium will be found in the stomach at the 24-hour examination due to regurgitation from the colon into the stomach through the fistula.

Gastro-colic fistulæ usually occur between the greater curvature and the ascending portion of the splenic flexure. In duodeno-colic fistulæ the stomach can usually be well made out as normal, while the fistula passes into the proximal portion of the colon.

Large, fatty stools and absence of trypsin can occur in this condition, so that they are not pathognomonic of pancreatic carcinoma. Disturbances of liver and pancreatic function may occur later as secondary phenomena. These are due presumably to ascending infection passing into the duodenum from the large bowel.

The author reports a case of fistula between the duodenum and the transverse colon due to an ulcerating carcinoma.

Leo G. Rigler, M.D.

EYE, EAR, NOSE AND THROAT

SUPERVISORS:
VIRGIL J. SCHWARTZ,
PHYS. & SURG. BLDG., MINNEAPOLIS
E. L. ARMSTRONG,
FIDELITY BLDG., DULUTH

HEAD PAINS OF OCULAR ORIGIN: Roderic O'Connor, M.D. (San Francisco. California and Western Medicine, Sept., 1925). It may be estimated that seventy per cent of all headaches are due to ocular disturbances. Ordinary eye examination may reveal nothing wrong, but more careful study will show latent errors of the extra-ocular muscles or a glaucoma. Early morning headaches are usually of nasal origin, while those brought on by riding in street- or motor-cars are most often found to be due to extraocular muscle trouble, compensation for which is more difficult when the eyes follow moving objects.

Basal, occipital and cervical pains may be due to changes in head position to compensate oblique astigmatism, vertical deviations, cyclophoria, or muscle paralyses.

Headache is a pain felt in the dural terminals of the trigeminus, of the upper cervicals, and of the vagus—especially the first. The centers of the third, fourth, fifth, sixth and seventh nerves are closely related and connected; the fifth is the nerve of sensation to the areas which the others supply as motor nerves, three of these innervating the eye muscles. We thus have a reflex arc. Communications from the ophthalmic division to the oculo-motor nerves are for ordinary sensation in the ocular muscles. Reflex ocular headaches may be due, therefore, to (a) overwork of the oculo-motor centers, with irritation of the fifth center by contiguity, (b) peripheral irritation of the sensory terminals in the muscles due to overactivity or to fatigue toxins. No matter how the fifth center is irritated, this is projected out to its dural terminals and is referred to as headache.

Glaucoma and some acute inflammations of the eye may cause headache; but there are several more frequent causes.

I. Pupillary asthenopia is the overstimulation, by a glaring sun- or artificial-light, of the mechanism which constricts the pupil. Refractive or muscle errors can often be found and corrected so as to render tinted glasses unnecessary.

II. Refractive errors.

1. Hyperopia is a condition wherein the accommodation is at work for distance as well as for near work; that is, the ciliary muscle is always at work when the eye is open.

2. Astigmatism causes much difficulty, especially when oblique, for the distortion thus caused must be compensated through rotation of the eye about an antero-posterior axis by the oblique muscles, or through head-tilting, or both together.

3. Anisometropia is a condition in which there is such a great difference of refraction in the two eyes as to preclude binocular single vision.

4. Presbyopia often causes trouble because of the overwork of the ciliary muscle, in trying to enable the hardening lens to change its focus.

III. Disturbances of the Extra-Ocular Muscles. Strabismus and paralysis are here excluded.

1. Esophoria presents visual axes which tend to converge, so that the corrective effort falls on the muscles of divergence, which normally have but little such work to do. The strain may be severe.

2. Exophoria shows visual axes which tend to diverge, so that the correction falls upon the muscles of convergence, which are used to this work, so that there is much less strain than in esophoria.

3. Cyclophoria shows a vertical axis which tilts in or out, calling for correction by the oblique muscles.

4. Hyperphoria presents the visual axis of one eye higher than that of the other, and causes symptoms of a sevcrity out of all proportion to the degree of error. One eye must turn up while the other turns down. A head-tilt and a drooping shoulder, to bring the eyes to a level, may be present; often there is elevation of one eyebrow, through associated action of the frontalis in an effort to bring the lower eye up.

5. Insufficiency of convergence is a condition wherein the visual axes cannot be converged close enough to allow protracted use of the eyes *at reading distance*, i. e., thirteen inches. Often these cases show normal balance for distance.

Treatment

A. Glaucoma—miotics or operation.
B. Refractive errors—lenses.
C. Muscle imbalances:
   1. Non-operative measures, as lenses, with muscle exercises and, when needed, prisms.
   2. Operative measures:
      a. Tenotomies.
      b. Shortenings.

VIRGIL J. SCHWARTZ.

OPHTHALMIC SIGNS IN COMMON NERVOUS DISEASES: W. Fletcher Stiell (Practitioner (London), Sept., 1925).

I. Migraine, often considered a functional disorder, is more likely the result of an angio-neurotic disturbance of the circulation of the sensory cerebral cortex, just as epilepsy is due to a similar disturbance in the motor cerebral cortex. Migraine usually occurs in persons with periodic, transitory visual impairment, such as hemianopia or scotomata, associated with a refractive error, most commonly myopic astigmatism. A heterophoria is occasionally present, and the fundus is normal. Correction of the refractive error and the muscular imbalance, together with the elimination of excessive mental and physical strain, will often effect a cure.

II. Epilepsy presents no diagnostic eye signs, yet some are of interest. Well-known visual aura precede the seizure, while during the latter there is a fibrillary twitching of the closed lids, followed by rapid opening and closing of the lids. The pupils are dilated and the conjunctival reflex is absent. Between seizures there is a characteristic wandering of the eyes, or a fixation upon some unimportant object, —that is, a loss of visual concentration.

Jacksonian epilepsy may present optic neuritis or post-

neuritic atrophy, due to pressure of the tumor or other condition causing the disease.

III. Disseminated sclerosis frequently presents a relative or an absolute central scotoma. Peripherally, also, the field may be defective, and transitory blindness occurs. Normal fundi or those with slight optic atrophy are seen. Retrobulbar neuritis is often found, and is evidenced by poor vision, pain on moving the eyeballs and pain on pressing them back into the orbits. True nystagmus is present in fully half the cases.

IV. Tabes dorsalis shows characteristic eye signs. The pupils are usually greatly contracted, but may be unequal, and are often of the Argyll-Robertson type. This latter condition, together with a primary optic atrophy, may precede the spinal signs of tabes by several years.

V. General paralysis of the insane presents pupils which are at first contracted, later dilated, often unequal and with a poor light reaction in the wider one.

VI. Encephalitis lethargica may show eye signs which are not at all proportionate in degree with the severity of the disease. The symptoms are (1) diplopia, from paralysis of the extrinsic muscles; (2) visual impairment, due to organic nerve changes or paresis of accommodation; (3) difficulty in keeping the eyes open, due to ptosis. The signs are (1) partly open eyes, which can by effort be fully opened, but only for a short time; (2) slight hyperemia of the conjunctiva; (3) a dull, dry cornea, with diminished reflex; (4) equal pupils which react sluggishly to light; (5) a slow, aimless side-to-side movement of the eyeballs; (6) optic neuritis, which may disappear or may progress to atrophy and blindness.

VII. Neurasthenia and hysteria can not be differentiated by eye signs alone. Persons between ten and thirty years of age, who have asthenopia, yet do not engage in excessive ocular work and have a refractive error of less than two diopters, are considered ocular neurasthenics. Persons who complain of asthenopia, without excessive eye work, with no refractive error at all and with normal muscle balance, are considered hysterical. Those who have, in addition, a full range of accommodation, are probably malingerers. At the trial case, the neurasthenic tries to attain 20/20 vision, something which the hysteric rarely attempts. A patient who is amblyopic in one or both eyes, with a concentric contraction of the field, yet with a normal fundus and no evidences of glaucoma, probably has nervous amblyopia. This conclusion is further substantiated by the finding of a spiral visual field of ocular fatigue.

Almost every eye symptom, and even many signs, may be found in the hysterical patient, among them being amaurosis, ptosis, blepharospasm, lacrymation, photophobia, squint, nystagmoid movements, and conjugate deviation of the head and eyes.

VIRGIL J. SCHWARTZ.

WANTED—Salaried appointments for Class A physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

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PSYCHOTHERAPY IN SURGERY*

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Paris

Following upon long illnesses of medical and surgical nature, the convalescent often gives evidence of functional deficiencies and unfavorable psychological habits. These two varieties of ills should be prevented or corrected by physiotherapy and psychotherapy.

Every physician should recall:

1. That all morbid conditions create new habits of mind and body which are maintained by autosuggestion. These troubles acquired during acute and particularly during chronic illnesses are in danger of becoming permanent after the local cure of the affection.

2. That "positive" feelings, calmness and optimism, are favorable to organic functions, and that "negative" feelings, agitation and anguish, produce acidosis, the presence of which is harmful to operated cases.

Pure psychotherapy is little used by the surgeon. He uses rather a mixed method where physiotherapy is joined to suggestion. Thus psychotherapy is used without the knowledge of the patient and often of the surgeon.

If, independently of professional practitioners of psychotherapy, surgeons rarely have recourse in a conscious and systematic way to this method, it is because of ignorance and skepticism, because suggestion is the oldest remedy in existence, and because the curiosity of doctor and patient is not aroused by it.

Suggestion is always efficacious. It is one of the most powerful therapeutic agents we possess. If we do not make more use of it, it is perhaps because it is always at our disposition, because its modus operandi cannot be taught to students, because we are hidebound, impatient for immediate results, and most of all because we are unwilling to make the effort to make use of it. Surely I am no more skilled in applied psychology than my ordinary colleagues, but I once read the writings of Paul-Emile Levi. Since then with entire faith in its results I have tried to use it in combination with physical means, which render the application of it very easy and more efficacious.

This mixed method is an invaluable aid in the cures of surgical cases.

We shall study it: (1) in the case of the inoperable patient; (2) in the case of those to be operated upon later; (3) in post-operative cases.

PSYCHOLOGY IN CASES WHERE SURGERY IS UNJUSTIFIABLE

Here are a few examples:

A patient seeks an operation for gastroptosis. Her stomach reaches the pubis. There is considerable emaciation. Nourishment is lessened. We notice acidosis resulting from lethargy. Operation is not advisable for the condition of decline is extreme. I order placed by the side of the patient's bed one of Pescher's spirometers, and I require her to breathe into it. She exhales 200 c.c. I explain to her that I can do nothing for her as she is too weak, but that soon she will breathe with her full lungs and will feel her strength growing.* Her attention is from now on centered on the readings of the spirometer. She notices hour by hour the amount of air she expels. I explain to her that with her increased lung capacity appetite and strength will return. This woman breathes into the apparatus every five minutes and without entering into the details of her convalescence I can inform you that in a fortnight she was exhaling two litres and that she walked home. She came to see me six months later. She was transformed. By the spirometer her lung capacity measured three litres. Her recovery was completed without an operation.

In this case the function of psychotherapy was united to that of the spirometer. I drew the attention of the patient to the spirometer, which more-

*A lecture given before the Society of Applied Psychology, Paris, November 26, 1925.

*Since the work of Georges Rosenthal we have learned of the stupendous influence of respiratory re-education on the stimulation of all the bodily functions.

over increases the quantity of oxygen and stimulates the action of the endocrines.

Continually surgeons order to bed for several weeks patients afflicted with salpingitis. What does the patient do during this period of rest? She knits, eats normally or reads novels. Her will-power grows less by lack of use, her muscles atrophy and fat accumulates. These handicaps persist after the treatment. So advise these invalids to make a systematic series of muscular efforts—to use a spirometer and exercise the diaphragm. These exercises will require about three hours of work and attention daily. When the patient gets out of bed, in—let us say—two months, she will not only not have grown fat, but she will have developed muscles and her lungs will function amply. Moreover, the necessity of motion and action in bed will have increased her will-power and will have been a discipline. Instead of a weak-willed woman or one amyotrophic or fat, you will find one who is capable of resistance and active.

THE FUNCTION OF SUGGESTION IN PREOPERATIVE CASES

Physicians who are confronted with surgical cases act variously according to the potential authority they wield. Some cause their patients to be operated on at the moment they believe right. Others seldom obtain their consent.

On what does this difference in submission on the part of the patient depend? Perhaps you will say that the men whose patients are not operated on are ignorant of symptoms and the results of operations. That is possible, though I would be inclined to blame the weakness of their motivating idea, the feebleness of their suggestive powers toward the patients. There are physicians who achieve with their patients just what they wish. Others are never listened to by theirs. On the one side the patient makes suggestions to the physician, on the other it is the physician who suggests to his patient. A competent physician, a conscientious and convincing healer, rapidly becomes the friend of his patients and these accept all his decisions whether they refer to intravenous injections of salvarsan, a long careful medical treatment, or to a surgical operation. It is the weakness of the character of the physician which causes the patient's refusal. The man who does not know how to exact obedience would have made a wiser choice of a sedentary profession with much rest and the early prospect of retirement.

THE PHYSICIAN'S LACK OF AUTHORITY IS SERIOUSLY PREJUDICIAL TO THE PATIENT

I do not need to discuss in this place surgical symptoms in general. I shall speak only of cancer and with regard to this I think no physician will contradict me. If I discuss an early intervention for megacolon, gastric ulcer, cholelithiasis, I can run into opinions encrusted in old unprogressive brains, but in attacking cancer all my colleagues will agree with me. Well, then, if we seek favorable results in the surgical treatment of cancer, early operations are indispensable. The physician must constrain his cancer patients to a rapid decision without, however, wasting them away with fear. This is just where his power of suggestion acts. Some hesitate—fearing the responsibility. The physician who allows a question of responsibility to delay him when the patient's life is in question is not a man of character. Ill fares the cancer patient whose physician is weak willed. Cancer surgery will be transformed for the better the day that the members of the profession, sure in their decisions, will know how to bring their patients to decide upon early operations. The suggestion of the physician should affect not only the patient but his whole environment. Those near the cancer patient are as so many antennæ to receive medical suggestion and transmit it to the sufferer.

SUGGESTION AS A PART OF PRESURGICAL PREPARATION

Before operating the surgeon should make a thorough examination of the patient, bringing his attention not alone to the pathological situation needing his intervention, but to his entire organism. Suppose the case to be one of appendicitis in a child. The surgeon having decided upon the operation notices in his examination that the child is a mouth breather, that he holds himself badly, that his muscles are poor, his color pale. The removal of the appendix will prevent an acute attack, but will do nothing to help the general condition.

"Your child breathes through the mouth," says the surgeon. "But, Doctor," says the mother, "we have had his adenoids removed." "For how long after the operation did he do breathing exercises?" "He has done none, but I have told him to close his mouth." Well, there is a useless operation. The throat specialist has not practiced suggestion upon the parents, nor has he exacted obedience, otherwise they would have required in their presence three-quarters of an hour of effective breathing

exercises. The surgeon in suggesting the idea of a respiratory re-education (Rosenthal) will fill the need left by the specialist.

Besides the open mouth the operator often notices thin muscles, a flabby abdomen. The family must be made to understand the necessity for abdominal exercises. "When the operation is over," the surgeon says, "the danger of appendicitis will be removed, but the child's muscular deficiency will not be corrected. Abdominal exercises must be ordered." "He has no time for exercises," says his mother, "because of his lessons." "Very well. He eats three times a day, does he not? Yes. Then take one meal away and have him do exercises for one-half hour instead. It is more important to breathe properly and to contract and expand the abdomen correctly than to eat." In view of this argument, the parents will decide to re-educate their child's abdomen.

Now, take the case of an exophthalmic goiter. Basedow's operation is helpful on condition that the patient has a thorough examination, is well prepared and operated upon under a local anesthetic. The physician must search for the underlying metabolism which may give a clue and determine the extent of the operation necessary. This may vary from the simple ligature of an artery to the removal of three-fourths of the thyroid gland. These patients are restless. First of all, their morale must be maintained. Sometimes they must be treated by isolation in the darkness, by placing near them a calm and optimistic nurse and keeping the family away. Thanks to these precautions the surgeon has the satisfaction of seeing pulse slow down, calmness return and the operation completed under the best possible conditions.

Whatever the operation may be,—goiter, stomach, appendix—the family who are in contact with the patient must be watched. Their psychological influence is very easily diagnosed. "See how pale my daughter is," says the nurse-mother. "She slept none at all last night but suffered without respite." This nurse-mother whose influence on her daughter is thus unfavorable, should at once be removed.

Another patient needs an operation for an affection of the stomach. The nurse tells the physician, "I did not wash out his stomach because he did not wish to have it done, or because he is too weary and begged to be let alone." This nurse should be replaced by another. A nurse who does not know how to require obedience is incapable of nursing. She should be sent to the linen room to hem bandages.

AFTER THE OPERATION

The precautions prescribed before the operation are now to be renewed. Now must one be on guard against the mother who declares that "her daughter has suffered and looks badly." Now one needs a calm and optimistic nurse who knows how to be silent or to speak to the point. She should as early as possible arouse the personal vanity of her patient. The man will be cleanly shaved. The woman will put on a fine chemise trimmed with pink ribbon, and these simple details of the toilet will hasten the patient to his recovery.

During this postoperative convalescence the nurse will add to her inspiring words the physical care which will restore confidence to the invalid and procure comfort and the joy of living again. Among the means to this end, rubs, massage and, above all, breathing exercises play an effective part. Spirometry is the most easily available of these agencies, not only because it oxygenates the blood, but because it requires a personal effort of special value. Friction and massage are a passive treatment which do not stimulate will-power, while voluntary deep breathing is a source of constant and beneficial autosuggestion. The patient must be shown the amount of air he exhales and this, without his knowledge, makes him repeat this autosuggestion: "Today I breathe more. I feel better than I did yesterday. My strength grows, my vitality returns, and my recovery is hastened."

I could give you the example of a young Belgian, an extremely clever fellow, on whom I operated for acute appendicitis. His intestines were swimming in pus. He was in a condition of emaciation. I made an incision in the right iliac fossa, then one in the rectum to drain a secondary pelvic ulcer. This boy was a mere skeleton. I prescribed rhythmic contractions of all his muscle groups and of the trunk and required spirometry of him. I gave him a nurse who was convinced of the value of physical means joined to suggestion. When this youth got up—three weeks later and only two days after his temperature dropped—he was just as full of resistance as one who had been twenty days on the way to recovery. Why so? Because in his bed he had not ceased to breathe deeply and to contract his muscles, nor to act for himself and make suggestions to himself. Thanks to psychotherapy and

physiotherapy he had made his recovery during the course of his illness.

I am convinced that psychiatrists will say, "You are not practicing psychotherapy, but physiotherapy." Yes, I give substance to the suggestion by a physical act so that the mind of the patient may be concentrated on a stimulative autosuggestion. The agency is twofold. Moreover, if the examples given do not suffice to convince you, I come to the re-education of those thrown out of equilibrium after abdominal operations.

PSYCHO- AND PHYSIOTHERAPY CHANGE CERTAIN SURGICAL DEFEATS INTO SUCCESSES

There is a type of ill-balanced people who complain of a falling stomach, of a floating kidney, of a uteral retroversion, of chronic intestinal stasis, etc.

Well. if you will recall the history of ptosis, you will remember the many operations which have been proposed without results; appendectomy, cholecystectomy, fixation of the stomach or a moving kidney, cecopexy, hysteropexy, or the more serious ovarectomy or gastroenterostomy. The fixing of a kidney, removal of an appendix, hysterectomy, can do no great harm, while castration for cystic ovaries or gastroenterostomy for gastric troubles without lesions, double or treble the morbid phenomena. These gastric cases operated on wrongly may still have the good fortune to meet a surgeon who will undo the operation, but for a woman whose ovaries have been removed there is nothing to do but to plant grafts of ovaries.

I do not say that ill-balanced abdominal cases do not—like others—need surgical intervention. Sometimes they even need several operations to overcome their many morbid troubles, but the surgeon prefers to attack the one which belongs to his own specialty and neglects the others. He should fight the most painful of the troubles to bring instant relief to the patient, and then attack another one if it is necessary. Invariably, if he has no recourse to psychotherapy and to physical culture, his labor is in vain. In this category of invalids needing the three treatments — physical, surgical and psychic — we meet the chronic and seriously constipated cases.

These subjects suffering from Lane's illness need a variable surgical intervention according to the case. If the diagnosis is not determined upon in a precise form the surgeon runs the risk of not benefiting the patient. But as soon as he is operated on he must in addition give him physiotherapy and psychotherapy or the result will be nil.

Lately, Pierre Duval has made a contribution towards proving that patients with long-standing intestinal stasis in whom the entire large intestine was removed developed first diarrhea and then later constipation. This is so, but this apparent failure needs explanation:

The colectomy was first accomplished, in several cases, where a less mutilating intervention should have been prescribed. For example: for subjects whose abdomens are firm and the intestinal parts are marked by fibrous adhesions, cutting these attachments followed by a well executed peritonization constitutes the chosen operation and suffices for the cure.

In certain cases short circuits or enteroanastomoses have been successful. In other cases, right-sided hemicolectomy or total colectomy is indicated.

Why then in these cases is there success after different interventions, or on the contrary failure? Because there are morbid elements which the operator has neglected to study. He has not taken the trouble to re-educate the sufferer from the physical and moral point of view. Patients of ten, fifteen or twenty years' standing have a changed metabolism, a modified nutrition. Because of a chronic poisoning their endocrines have become insufficient. They must be treated with organotherapy. A large number of them have become weak-willed or excitable. Their will must be re-educated and their erethism calmed. They have acquired the habit of pitying themselves and suffering. They must be taught to become optimists. Psychotherapy fills this rôle. It must always be joined to physical culture, to organotherapy, since these operated cases are defective in breathing, in their endocrines and muscularity. In these conditions massage, general and respiratory gymnastics are of the greatest service.

I reply to the objection made against colectomy, that those operated on have at the outset diarrhea and then become constipated as a consequence. The initial diarrhea excites the sensibility of the rectum. This providential sensibility! It should be welcomed with enthusiasm as a starting point for the clearing reflex. But the profession called for advice are in haste to prescribe! For the diarrheic surgical cases—bismuth to thin out the stools and banish the new reflexes once more which have

for years been abolished. The constipation which follows is thus of a therapeutic origin. Diarrhea would have ceased of itself and would have been reduced to two or three passages a day—several passages which must be respected for they keep awake the evacuation reflex.

PSYCHOTHERAPY MUST BE TAUGHT TO ALL PHYSICIANS, WHATEVER THEIR SPECIALTY

Psychotherapy applied by non-specialists and associated with physical means is necessarily applied without direction and without method. Thus it is perhaps less effective. It would be better for us if the psychotherapists did not busy themselves with our operated cases, our convalescents, in the effort to cure them. This desideratum is easy enough to achieve with an intelligent invalid who can understand the need of psychic re-education, but others reply to our advice of psychic treatment: "I am not crazy, nor a hypochondriac. The cause is removed, my cure should accomplish itself alone." An intelligent patient will understand that he has psychic deformities that only a mental orthopedist will succeed in banishing. Intelligent people are a minority. What shall we do with the others? Make suggestion real by physical means which moreover are indispensable for their need. The psychotherapists must arrest the attention of their patients, draw them by ultra-violet rays, x-rays, massage, injections, what not? That it is easier to exercise without the knowledge of the patient a psychotherapic course of action.

I have seen patients going to Swiss cures where physical care and diets were given. When the director was present the results were satisfactory. When he was absent successes were rarer. Why?

Psychotherapic action is personal. There is no psychotherapy—there are psychotherapeutists.

The inquirers of a doctor of suggestion are content with applying the physical and dietetic treatments. Necessarily their influence is diminished. I made this remark to a Swiss colleague who has a world-wide success. I called his attention to the fact that the success of psychotherapy is purely personal and I reproached certain of his assistants for having no influence on the patients. He replied thus to me: "But, my dear friend, to succeed in psychotherapy one must have a tonus, a radioactivity that not all men possess."

In brief: in medicine as in surgery there is no single treatment. The therapeutist must in every case add to the action of surgery or medicine, physiotherapy and psychotherapy if he wishes to obtain the best results.

THE KROMAYER LAMP

According to experiments made by the manufacturer, Hanovia Manufacturing Co., the Kromayer lamp emits no radiation shorter than 2,000 Ångström units or longer than 14,000 Ångström units. Of the total radiation emitted, approximately 65 per cent falls in the ultraviolet field. The apparatus is dependable, but no assertion can be made as to the properties of the rays. The company has collected the reports of results of investigations with the lamp, and supplies the references. (Jour. A. M. A., Mar. 27, 1926, p. 972.)

RADON (RADIUM EMANATION)

It has been reported that the intravenous injection of long-lived radioactive elements or the internal administration of radium, mesothorium or radiothorium is highly dangerous on account of the delayed harmful effects. This is due to the deposit of insoluble particles of these elements in the storage organs, namely, the bones, spleen and liver. These possible dangers apply to the administration of solutions of radium salts, but not to the ingestion of water charged with radium emanation (radon), since this is eliminated rapidly, the elimination being practically complete in the healthy individual in twenty minutes. (Jour. A. M. A., Mar. 20, 1923, p. 893.)

CURAY LIGHT APPLICATORS

The source of light in a Curay lamp is an incandescent tungsten filament enclosed in a glass bulb. When used in the Curay apparatus, the lamp is operated on a higher current than its normal rating carries and therefore the life of the lamp is much reduced. The spectral energy distribution of the Curay lamp is mostly emitted in the form of heat and but a small fraction of the energy is emitted as ultraviolet rays. As compared with the quartz mercury arc lamp, the amount of ultraviolet rays emitted by the Curay lamp is insignificant.

The light of the Curay lamp is not comparable with sunlight, for not only is the total amount less than that of sunlight, but a much smaller proportion of the energy is in the form of ultraviolet rays. Further, the lamp has a glass bulb which strongly absorbs the ultraviolet rays given off by the filament. An exposure of the skin in actual contact with the quartz rod "applicator" supplied with the Curay lamp for one-half hour showed no ultraviolet erythema; an exposure of three and one-half minutes at a distance of one meter with a quartz mercury vapor lamp produced a marked erythema. The Curay Company supplies letters containing an account of supposed "cures" of colds and bacterial infections, but these concern uncontrolled experiments. (Jour. A. M. A., Mar. 27, 1926, p. 971.)

CLIFFORD ALLBUTT AND MEDICAL OPHTHALMOSCOPY*

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To every man who is earnestly endeavoring to increase his knowledge of the ways and means of diagnosing disease, there comes a time when he must look back to the foundations of the structures he is building. The conception that we now hold of the causes and courses of disease is made by correlating facts with observations and impressions which in themselves are dependent on reasonable but variable indefinite factors, capable of intelligent interpretation in the light of present-day knowledge. But as observations and impressions are really the reaction of the mind of an individual to his environment, there must necessarily be divergence of opinion and ground for controversy. The builder can hardly hope to keep his structure plumb except by repeated testing with his base level; and the synthetic product of carefully annotated observations must be measured by the balance of the weight of evidence.

During the last century, the means whereby clinical, chemical, and physical phenomena are observed and measured have been drawn from the field of science as opposed to the philosophic syllogisms of the savants of previous eras, and the progress of the science of medicine has been immeasurable. The invention of instruments of precision, particularly of optical instruments, together with the adoption of discoveries in physiologic optics, has opened new fields. The trails blazed in these new lands by pioneers become paths to be used by increasing hundreds of travellers and students, and views are described from points of vantage along these trails. After a time, it becomes necessary to rechart such territory and often to readjust conceptions. The ground must be gone over with improved instruments, and closer observations made and data carefully collected and checked against data previously gathered.

It becomes appropriate from the standpoint of present-day investigations into the course of disease to look back to the foundation of one of the most useful means of observation that has been introduced into the science of medicine, that of ophthalmoscopy, and to view its present structure from the bottom up. The whole of the medical profession united in February of this year in regretting the passing of Sir Clifford Allbutt, who died at the advanced age of eighty-eight. He was the acknowledged leader of the profession in his country and had attained to this position by outstanding clinical experience, by an unrivalled knowledge of the literary side of our science and by his wonderful ability to deal with men and things.

It is said of Allbutt that "he rapidly formed a sound judgment in new work, and was ever alert to welcome the germ of a real advance; thus, in his reviews of the book on the pulse by the then (1902) little known James Mackenzie, of Burnley, he generously described it as destined to 'take a permanent place in the standard records of the subject.'" It is indeed remarkable how many matters of now common knowledge in medicine he either originated or made more widely known, although in some instances his share therein has, with lapse of time, been perhaps noticeably forgotten. In 1867, he invented the present form of the clinical thermometer. He was one of the first, if not the first, to describe syphilitic disease of the cerebral arteries (1868). He early insisted on the value of morphin in cardiac disease (1869); on the effects of strain on the heart and arteries (1870); on the use of the stomach pump and of the ophthalmoscope in medicine (1871). For many years he described hyperpiesia, or, as he originally called it, senile plethora (1895), and while so doing was largely responsible for the introduction of the sphygmomanometer into ordinary practice.

As has so often happened with important discoveries and inventions, Helmholtz' contrivance of an Augenspiegel with which to inspect the interior of the eye, first described in a monograph published in Berlin in December, 1851, seems to have been but the logical outcome of a series of interesting observations made by a number of investigators in the field of physiologic optics. But oddly enough, the problem which these investigators, with the exception of Cumming, were endeavoring to solve, and which Helmholtz himself had in mind, was not the discovery of a means by which the background of the eye could be inspected and pathologic changes situated there recognized, but a solution of the question why, under usual conditions, the pupil of the eye appears black and seems to

*From the Section on Ophthalmology, Mayo Clinic, Rochester, Minnesota. Read at the meeting of the Minnesota Academy of Medicine, Rochester, Minnesota, November 12, 1925.

emit no light, while, under certain unusual conditions, it does emit light and assumes a reddish appearance.

The luminosity of the eyes of certain animals had long been a subject of study, and many erroneous theories had been advanced to account for it; but it was not until Prevost of Geneva, about 1810, pointed out that in an absolutely dark room the luminosity disappears, was it understood that this phenomenon was due simply to the reflection from the tapetum of light which had entered the eye through the pupil. Rudolphi made a further step toward a right understanding of the matter when he showed that in order to perceive these reflected rays, it was necessary to look into the eye in a certain determinate direction. Still more important, however, and bearing more directly on Helmholtz' invention, were the investigations and observations of William Cumming and Ernst Wilhelm Bruche. At about the same time and without knowledge of the other's labors, each of these investigators had succeeded, and by similar methods, in obtaining a reflex from the background of the normal human eye. In 1847, four years before Helmholtz announced his invention, Charles Babbage, F.R.S., an English mathematician and inventor, by scraping off a little of the silvering from the back of a plain mirror, which he set obliquely in a suitable tube so that the light falling on it from an opening in the side of the tube should be reflected into the eye, contrived an ophthalmoscope which was much more like the instrument of today than was that of Helmholtz and which unquestionably afforded a better illumination of the eye. But, unfortunately, the ophthalmic surgeon to whom he showed it did not recognize its importance, and he laid it aside without making it generally known. As Helmholtz' first instrument was merely a sheet or sheets of plain glass set at an angle in a pasteboard box, it was difficult to use. He himself later said of it, "It was at first so difficult to use that I doubt if I should have persevered unless I had felt that it must succeed; but in eight days I had the great joy of being the first who saw before him a living human retina."

Among the first to appreciate the true importance of Helmholtz' invention and to acquire facility in its use were Von Graefe, to whom Helmholtz sent one of his earliest instruments; Liebreich, who was an assistant of Helmholtz at the time the ophthalmoscope was invented; Donders and Jaeger, Desmarres, Bowman and Hulke. Williams of Cincinnati (1854) spoke of the ophthalmoscope in terms of highest commendation and was the first to introduce the new instrument to the knowledge of the medical profession in this country. In answer to the question, "What has the ophthalmoscope done for ophthalmology?" perhaps a more comprehensive answer cannot be given than to say that it has done all that Helmholtz promised it would do. His prediction was that it would show alterations in the retina just as the unaided eye saw them in the cornea and iris; that it would enable us to detect congestion of the retinal vessels and inflammatory exudations on or in the retina or between it and the choroid; that it would permit us to recognize more easily and certainly the presence of high degrees of opacities of the crystalline lens and that by its aid we should be able to detect the exactness or measure the amount of farsightedness or nearsightedness; and, in short, all that dissection had shown in the dead eye it would enable us to recognize in the living one. A more striking example of prediction than his, it would be difficult to find. But ophthalmology is not the only department of medicine that is beholden to the ophthalmoscope. The specialist in diseases of the eye had hardly learned to appreciate its value before his brethren interested in affections of the brain and the nervous system began to realize how great a boon it was to them as well. Von Graefe and Sichel were among the first to recognize and point out the close relationship existing between optic neuritis and cranial diseases. Hughlings Jackson in London and Clifford Allbutt in Leeds profited by their suggestions, and were the first to approach the subject from the standpoint of the neurologist. These two men may well be called the fathers of medical ophthalmoscopy.

In 1865, Hughlings Jackson said,* "It is imperative in all cases of severe cerebral disease—at all events in cases of an acute kind, to examine the eyes with the ophthalmoscope, whether the patient complains of defect of sight or not. The intraocular condition most frequently discovered in physicians' practice is double optic neuritis; and it is very common for this condition to exist in a patient who can read the smallest type and who supposes his sight to be good. There is a morbid pathological change without a symptom."

*Royal London Ophthalmic Hospital Reports.

A prime contribution to the technical side of scientific medicine was made by Allbutt at an early stage of his career, for although no particular ophthalmoscope bears his name, no one man contributed so largely to the recognition of the value of the ophthalmoscope in the earliest days of its invention by Helmholtz. Fifty years ago, when the ophthalmoscope was a comparatively new instrument, many who employed it were too sanguine of the gains that would accrue from the recently acquired ability to see nerves and blood vessels in such immediate relation with the brain. They saw that the instrument should pave the way to an improved diagnosis of cerebral affections, and the discovery of the forms of retinitis that depend on renal or other remote disorders was hailed as sure to lead to advances not only in diagnosis, but also in pathology and therapeutics. But as time went on, those expectations became less confidently expressed, for it was apparent that the new page opened to clinical observation was not of the kind which he who runs may read. Persons unskilled in the use of the instrument, and unable to interpret the appearances that it revealed, not infrequently made and published serious blunders; they afterward neglected the help they had misused.

In the meantime, a few patient workers toiled steadily on, collecting data, comparing evidence, and eliminating sources of error. Among these workers Clifford Allbutt was one of the most prominent, and at the proceedings of various medical societies and in the columns of the various professional journals, he explained methodically the use of the ophthalmoscope, defining its range and annotating the phenomena made apparent by its use. In 1871 he brought all this work together into a connected volume which was the only existing general treatise on its subject at the time. The book, which dealt with the use of the ophthalmoscope in disease of the nervous system and the kidneys in particular, but which took note of the employment of the new system in many general disorders, began with an emphatic and personal testimony to the value of the direct image in the recognition of early and slight changes, and explained the common sources of error in interpretation. An orderly account was then given of the variations from health of the optic nerve and the retina, while the relation between these variations and intracranial and other general disorders was discussed in detail. The work was recognized from the first as full of sound reasoning founded on careful observation, never carrying conclusions further than the facts would warrant, but bringing together all the facts as far as they could be ascertained to bear on the question at issue. The book was reviewed in The Lancet just fifty-three years ago, and how much it was needed is indicated by the last words written about it, which were: "It will convince the most skeptical that the ophthalmoscope is an instrument no longer to be neglected as a means of diagnosis in general medicine."

The fourth chapter of the book is devoted to an account of the variations from health of the optic nerve and retina. In this, the distinction between anemia of the disc and atrophy is extremely well described; and the author then seeks to establish a similar difference between the mechanically congested, or strangled, and the inflamed disc; that is, between the *Stauungs-papille* and optic neuritis. It was pointed out by Von Graefe that any cause of pressure, acting on the cavernous sinus, must necessarily retard the return of venous blood from the retina; and that the resulting passive congestion would be intensified in the optic disc by the additional construction of the unyielding opening in the sclerotic. The resulting hyperemia and effusion constitute the *Stauungs-papille* and may in some cases be distinctly diagnosed from the swollen disc of genuine descending neuritis, or from the neuritis which may be secondary to venous obstruction. Allbutt applied the word ischemia to describe the condition of *Stauungs-papille*, but also gave us the English equivalent "choked disc." It is to the latter term that subsequent writers have adhered. The difference between a choked disc from pressure such as may be occasioned by the growth of an encephalic tumor, and an inflamed disc, such as may be produced by the extension of disease in a case of basal meningitis, is one readily appreciated by the understanding. As an indication of the skepticism with which his work was held it is interesting to note that a question still actively debated in the ophthalmologic societies of today was voiced by the reviewer of his book, when he stated: "We think, however, especially when it is considered that the choking becomes itself a cause of inflammation, and that the inflammation becomes a cause of effusion and proliferation, that the two conditions would with great difficulty be certainly distinguished by inspection through the ocular media and we rather doubt

whether the signs on which diagnostic inferences may be founded are very capable of being so expressed in words as to convey the same meaning to every reader. We should never be surprised to find a difference of opinion between skilled persons on the question whether the state of a given disc had been originally choking or inflammation. The difference is one highly important to be kept in view by every observer; and each one may, with advantage, seek to educate his own eye to its appreciation. But it is, after all, rather a question of minute shades of difference in the appearances present at a given time, and of the relative predominance now of one, now of another, factor, in cases in which both are present."

Within twenty years then from the time the first crude ophthalmoscopes were introduced, the foundations of our knowledge of ophthalmoscopy were laid and the relationships between the visible changes in the fundus of the living eye and constitutional disturbances were established. The first ophthalmoscopes were used for viewing the fundus by the indirect method. The image of the retina was small and the optic nerve the most prominent feature of the fundus. It is quite natural that the first definite relationships should be established about the visible changes in the optic nerve, and both Allbutt and Gowers because of their interest in neurology were quick to recognize the advantage of ophthalmoscopic examination. On one occasion, Allbutt reported on the importance of ophthalmoscopic examination as an aid in the diagnosis of tuberculous meningitis. It was his opinion that the discs were red and inflamed as a result of the extension of the inflammation along the dural sheath at the base of the brain, and that the optic nerve showed with the ophthalmoscope what one would expect to find at necropsy as a result of continued irritation without increased intercranial pressure. In this same article he recognized the infrequency with which tubercles of the choroid may be seen and stated clearly that he would not expect to find tubercles in the fundus in a case of tuberculous meningitis.

Early in his career, Allbutt was interested in diseases of the kidneys. He was one of the first to recognize and to describe changes in the fundus accompanied by diseases of the kidneys, and he has described at length changes resulting from nephritis in disease of the cardiovascular system. Allbutt's active participation in ophthalmology waned somewhat in the latter half of his active work. As the instrument became more generally used in the ophthalmic hospitals, he quoted more and more frequently from ophthalmic surgeons than from his own observations. While he did not describe the changes in the fundus that we now recognize as characteristic of certain diseases of the circulatory system, he paved the way for investigation of these diseases by his masterly work on diseases of the circulation in general, particularly on diseases accompanied by high blood pressure. In recent years, there have been described as clinical entities retinitis of arteriosclerosis of the type mentioned by Allbutt as atherosclerosis, the retinitis of nephritis, retinitis of hypertension (hyperpiesia), and the retinitis of malignant hypertension. These affections of the retina are now quite generally conceded to be distinguishable in their single form, and to exist in combination with one another and to be directly related to definite clinical findings. The retinitis of arteriosclerosis as described by Foster Moore (1917) was the first definite classification to be made from the general group of retinal disturbances that had come under the name of albuminuric retinitis.

A number of observers have from time to time called attention to characteristic changes in the caliber of the vessels and the reflex from the retinal arteries in persons having high blood pressure with evidences of disease of the kidneys, as well as in persons in whom no disease of the kidneys could be demonstrated. The line between hyperpiesia and the hypertension associated with renal disease is not clearly marked clinically, but there are certain changes in the retina that are so characteristic of hypertension alone that it is possible in many instances to infer that the kidneys are not involved.

In 1923, I published an article calling attention to two types of retinal conditions which indicate clearly a rise of blood pressure: first, the retinitis of hyperpiesia, and second, the retinitis of malignant hypertension, and pointed out the relationship between these conditions, and the superimposed evidence of renal dysfunction. Other investigators in the field of medical ophthalmoscopy have devised means of measuring directly the intraocular vascular blood pressure in both the veins and in the arteries, and have been able to correlate the ophthalmoscopic evidences of hypertension and sclerosis with the findings of the ophthalmodynamometer.

The retinal arteries normally appear immobile. The pulse excursion in vessels of such small caliber is too slight, under physiologic conditions, to be detected ordinarily. However, Kummel and De Speyr find that with the magnifying ophthalmoscope of Gullstrand, this phenomenon can almost constantly be observed.

In certain pathologic conditions, however, an arterial pulse occurs that is revealed by the ordinary ophthalmoscope. Such cases are found in glaucoma, syncope, severe anemia, and aortic regurgitation. If, while looking at the fundus with the ophthalmoscope, the observer exerts gently increasing pressure on the globe, an arterial pulse will appear. This induced pulse is particularly marked in juveniles. In the adult, the pulsation induced is less extensive, but in all cases the pulse can be noted, although in the aged it may only be observable at one point. This pulsation can be seen with indirect ophthalmoscopy, but the details are much better studied with the direct method.

As the pressure on the globe increases, so does the amplitude of pulsation, to a certain point; it then grows less, and disappears. If the pressure is further continued, the artery becomes effaced suddenly, and, blending with the tissue anemia around it, is no longer visible.

The mechanism of the arterial pulse, whether spontaneous or induced, is based on the same principle. As intra-ocular tension increases, the lumen of the artery is diminished, and when the intra-ocular tension is equal to the diastolic blood pressure within the artery, one neutralizes the other. The diameter of the artery then is that assumed by a vessel containing blood under no pressure, and kept patent only by the stiffness of its walls. The pulse wave, finding this portion of the artery thus completely relaxed, causes a maximal distention of its walls, and a correspondingly large pulse excursion. If the intra-ocular tension is increased beyond the diastolic pressure, it not only neutralizes the latter, but overcomes the stiffness of the arterial wall. In this case the pulse wave must expend part of its energy in overcoming the excess pressure on the outside, and accordingly the movements of the walls with the pulse wave are less extensive in proportion to the excess of pressure on the outside.

Normally, the diastolic pressure in the central artery is greater than the intra-ocular tension. Hence, to produce a visible arterial pulse we must increase this tension by pressure on the globe. Pathologically, the intra-ocular tension and the diastolic pressure may become more or less equalized in two ways: in glaucoma the intra-ocular tension is increased; in syncope, anemia, and aortic regurgitation, the diastolic pressure is reduced.

In eyes with normal tension, the average retinal blood pressure is 30 to 35 diastolic, and 65 to 70 systolic. Among normal persons, all other factors being equal, these findings are fairly uniform. Under physiologic conditions, the pressure in the retinal arteries is entirely dependent on systemic blood pressure and follows its variations. Knowing the systemic blood pressure one can generally safely predict the retinal blood pressure, and vice versa. Multiplying the systemic diastolic pressure by 0.45 will give the retinal diastolic pressure. If the reciprocal relation shows a variation of more than 5 to 10 mm. of mercury from that observed, the lack of accord should be noted and investigated.

There is a somewhat less constant relationship between the systolic pressures, but multiplying the systemic systolic pressure by the coefficient 0.54 generally gives a good approximation to the retinal systolic blood pressure.

The diastolic pressure in the retinal artery is already almost on the capillary level. The systolic pressure has not fallen proportionately quite so much, for to it belongs the duty of overcoming the great capillary resistance, and in this task, its energy will be quickly spent. In the capillary bed itself there is no pulse, and diastolic and systolic pressure become one.

Hypertension of the retinal vessels is most usually associated with systemic hypertension. Normally, the retinal diastolic pressure is 0.45 of the systemic diastolic pressure, but in hypertension cases, the retinal diastolic pressure is more than proportionately elevated. In three of Bailliart's cases, with respective systemic diastolic pressures of 120, 140, and 160, the retinal diastolic pressure was, respectively, 60, 80, and 86. Because the retinal systolic pressure cannot very well be measured above 150 mm. we have been unable to determine how the retinal pressure is affected in cases of extreme systemic hypertension.

I shall not discuss here the significance of these very important observations made by our new methods of examination. The self-lit ophthalmoscope may be employed by every physician with as much value as any other bit of apparatus to which he can turn his hand. In the fifty years that have

elapsed since Allbutt published his first work on medical ophthalmoscopy, many volumes have been written embodying the findings of observers all over the world. Unfortunately, the use of the ophthalmoscope has been left largely to the ophthalmologist; practitioners who otherwise pride themselves on their equipment have quite generally excluded it. Ophthalmology as a specialty has grown farther and farther away from general diagnosis and even though the oculist may be skilled in the use of the ophthalmoscope, he has not the opportunity to apply it in general diagnosis to the best advantage.

I would like to urge all physicians interested in the progress of the science of medicine as well as in the refinement of their own methods of diagnosis, to employ the ophthalmoscope with the same regularity that they use the stethoscope and the speculum, and with the same desire to add to their keenness of perception the observations which are made possible by the ophthalmoscope and the foundation so generously laid down by Clifford Allbutt.

REPORT OF THE COUNCIL ON PHARMACY AND CHEMISTRY

During the past year, the Council has carried forward its work of informing the medical profession in regard to proprietary medicines which physicians are importuned to use. The work of this body of trained men who labor untiringly and without remuneration in the cause of rational and scientific medicine deserves wider recognition and acceptance. It will receive this when physicians recognize more generally the fact that those who compose the Council have the needed specialized training to enable them, better than the average physician, to form a correct estimate of the many new medicaments appearing each year. The Council publishes the annual New and Non-official Remedies which describes the medicinal preparations that are acceptable to the Council. Products not accepted are reported on in the annual reports of the Council and these reports are collected in the Propaganda for Reform in Proprietary Medicines. In addition the Council publishes the Epitome of the U. S. Pharmacopeia and National Formulary and the book, Useful Drugs.

While the Council has brought about a revolution in the field of therapeutics, much remains to be done. The success of the further endeavors of the Council will depend largely on the support which is given by the rank and file of the medical profession. Support can be most efficiently given by physicians and with full justice to themselves and their patients by confining their use of proprietary medicines to those which have been found acceptable for inclusion in New and Non-official Remedies. (Jour. A. M. A., Mar. 20, 1926, p. 850.)

THE FORMATION OF BILIRUBIN*

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Experimental evidence pointing to the existence of hematogenous jaundice has until recently not been convincing. The observation of Mann and Magath on jaundice appearing in dogs following complete extirpation of the liver established the fact that bile pigment, at least to a considerable extent, is formed outside of the liver. A few hours after hepatectomy in dogs, the urine contains bilirubin, and there is a progressive increase in the bilirubin content of the blood, so that about sixteen hours afterward the sclerotics and mucous membranes appear jaundiced. Further work demonstrated that jaundice appeared in the absence of all of the abdominal viscera. Since the source of bilirubin was not entirely in the abdominal cavity we have looked for its formation in the extremities.

The spectrophotometric method of quantitative determination of bilirubin shows that bile pigment is present in normal dogs' blood, and small differences of concentration are readily determined. This method has enabled us to determine the bilirubin content of the arterial blood entering an individual organ of the dog, and to compare it with that of the venous blood leaving that organ.

The instrument used in these investigations was a form of spectrophotometer recently brought out by Keuffel and Esser and referred to in the literature as a "color analyzer." In essentials, it consists of a lamp-house carrying two magnesium blocks (cut from the same cake) placed at the rear; these blocks serve as sources of light. The beams of light reflected by these blocks, after passing through two suitable openings in the front of the lamp-house, enter the two receptacles, containing the solution and the solvent, respectively, which are placed in proper position in front of the slit of the spectrometer. The spectrometer proper does not differ in fundamentals from the ordinary constant-deviation type of instrument except in the presence of a biprism, placed in front of the tele-

*From the Division of Experimental Surgery and Pathology and the Section on Physics, the Mayo Foundation, Rochester, Minn. Read at the meeting of the Minnesota Academy of Medicine, Rochester, Minnesota, November 12, 1925.

scopic lens system, and an observing (exit) slit in the eyepiece. A balance in the intensities of the light transmitted by the standard cell and by the solution under examination is made by means of a sector photometer, the intensity of the light transmitted by the standard cell only being varied. In all of the experiments described in this paper, both containing tubes were 10 cm. in length. The standard cell was filled with distilled water, the other carried the solutions to be examined. This procedure was adopted in order to introduce equal quantities of glass and liquid into the two optical paths.

To obtain the experimental data, white light is passed through the two containers placed in front of the housing containing the rotating sectors and is admitted to the spectrometer. The spectrometer is set at any desired wave-length by means of a calibrated wheel. The percentage transmission of the solution for any wave-length or region of the visual spectrum as compared to the percentage transmission of the liquid (which was water in every case) in the so-called standard cell is read directly from the calibrated drum-head. This drum-head is mechanically attached to the sectored disks in such a manner as to permit of its rapid turning by hand, thus providing a quick way of varying the relative proportions of open and closed sector areas.

Much has been learned in these investigations about the criteria which must be adopted and followed in order that the spectrophotometric data may be used in deducing the final conclusions which we have reached. These criteria are clearness of blood serum and freedom from hemolysis. For, if solutions are foggy or carry fine particles in suspension, there is a marked increase in the percentage of light absorbed in the absorption zone of 500 to 430 millimicrons. Freedom from hemolysis is equally as important as clarity of serum. A single drop of hemolyzed blood added to the contents of the 10 cm. tube will produce a marked absorption in the yellow region (580 millimicrons) of the spectrum and cause an increase of approximately 40 per cent in the absorption zone characteristic of bilirubin (that is 500-430 millimicrons, or violet end of the spectrum).

In order to get some idea of the sensitiveness of the spectrophotometric determinations as compared to the van den Bergh test, we took a sample of bile from the gallbladder of a normal dog, diluted to approximately 0.000001 gm. bilirubin for each cubic centimeter (which is the limit determinable by the van den Bergh method) and found, on repeated dilution with alcohol, that we could determine quite accurately the presence of one-fiftieth of the amount which could be measured by the van den Bergh test. Comparing our spectrophotometric determinations with known dilutions of bile, we have found that we are dealing, in the experiments reported in this paper, with quantities of bile pigment varying from 0.04 to 0.015 mg. for each 100 cubic centimeters.

The results of these spectrophotometric investigations are very conclusive. The bilirubin content of blood from the various arteries throughout the body was uniform and blood from renal veins or mesenteric veins had the same bilirubin concentration as arterial blood. Definite increases in bilirubin content were found in blood of the femoral, axillary, jugular, azygos, internal mammary and splenic veins. Obviously bilirubin had been added to the blood from the regions drained by these vessels.

It was possible to reduce the number of kinds of tissue drained by the veins of the extremities by surgical removal of the bone of the leg with careful preservation of the remaining muscle, skin and fascia. After this was accomplished, the increase in the bilirubin content of the blood of the femoral vein disappeared, and the blood returning from the leg contained the same amount of bilirubin as the blood going to the extremity. This led us to believe that the bone marrow was the site of bilirubin formation in the extremities. Using a modification of Drinker's technic, we isolated the blood supply of the tibia and of the gastrocnemius muscle. Venous blood returning from the muscle showed the same bilirubin concentration as the arterial blood, while blood returning from the bone showed a marked increase in bilirubin content.

There is a large quantity of data to show that bilirubin is made from hemoglobin. Following the injection of hemoglobin into the circulation of dogs there is an increase in the amount of bilirubin in the blood returning from the spleen and from the bone marrow. After injecting small amounts of hemoglobin directly into the splenic artery we have shown that there is a definite increase in the amount of bile pigment leaving the spleen by the splenic

vein. This increase appears at from fifteen to thirty minutes after injection and continues for from thirty minutes to two hours afterward, depending on the amount of hemoglobin injected.

Besides the hemoglobin and bilirubin which appear in the splenic vein after injection of hemoglobin, a new substance may be identified by the use of the spectroscope. It has all of the photospectroscopic characteristics of hematin, and since hematin is known to be a product of the chemical distintegration of hemoglobin, it would seem that hematin is an intermediate product in the formation of bilirubin from hemoglobin. Our investigations thus far have proved that bilirubin is formed in the spleen and bone marrow, and is formed from hemoglobin; and that hematin appears as an intermediate product in the formation of bilirubin from hemoglobin.

DISCUSSION

Dr. Hilding Berglund, Minneapolis: Looking upon the problem of bile pigment formation from an historical point of view, Virchow was the first, I believe, to find bile pigment in old hemorrhagic exudates of the pleural cavity. This type of bile pigment formation was usually conceived as a slow process. Through the highly suggestive work of Whipple, and, particularly, through the more conclusive work of Mann and his co-workers, we now know the normal bile pigment formation or the normal blood destruction —the same thing expressed in two different ways—to be a comparatively rapid process. We may now estimate in hours what we used to estimate in weeks or months.

Cushing has recently reported high concentrations of bilirubin in the dark-colored fluids of cerebellar cysts. I had the pleasure to perform the determinations and our conclusions are based on Ehrlich's old diazoreaction taking place in strongly acid solution — a reaction nowadays known as the indirect van den Bergh test. Even this more exceptional type of bile pigment formation in hemorrhagic exudates or hemorrhagic cysts probably takes place at somewhat the same rate as the normal one. Here I again refer to an observation of Cushing's: when two or three days after an operation for brain tumor Cushing again exposed the field of the operation he could observe a distinct greenish discoloration along the edges of the subdural blood clots.

Before I finish allow me to express my congratulations upon the very beautiful results just reported. The fact that it has been necessary to work out a new spectrophotometric method before the work could be carried out only adds to the pleasure to recognize the importance of the results obtained.

Dr. Bollman: I might follow the suggestion of both Drs. Berglund and Rowntree and point out one thing which I neglected to mention. In establishing sites of bilirubin formation in the bone marrow and spleen we have localized its formation in the organs most rich with cells of the reticulo-endothelial system. It seems probable that other cells of this system would have the same ability to form bilirubin. The formation of bile pigment from hematomas or extravasated blood is perhaps due to this same system of cells and the rate of the change of hemoglobin to bilirubin depends upon the number of reticulo-endothelial cells in the surrounding tissue as well as the concentration of the wandering endothelial cells in the region involved.

REPORT OF THE A. M. A. CHEMICAL LABORATORY

During the year, the Laboratory has been engaged largely in evaluating synthetics and drug preparations for the Council on Pharmacy and Chemistry and in analyzing nostrums for the Bureau of Investigation. The work which the Laboratory does for the Council on Pharmacy and Chemistry is becoming increasingly involved and difficult. Similarly the analysis of patent medicines for the Bureau of Investigation is more complicated than formerly. The Laboratory also carries out independent investigations: thus it has published a report on the quality of the market supply of cinchophen, a study of bismuth compounds and a study of liquid petrolatum-agar mixtures. The value of a chemical laboratory maintained by the American Medical Association is thoroughly demonstrated when comparisons are made between conditions existing in this and other countries. While abroad certain proprietaries are claimed to have this or that chemical structure, these claims are not made for them here when their composition has been shown to be otherwise. (Jour. A. M. A., Mar. 20, 1926, p. 851.)

THE DEFEAT OF THE STREPTOCOCCUS IN MEASLES, ERYSIPELAS AND PUERPERAL SEPSIS

When the announcement was made that the Drs. Dick had shown that scarlet fever is a disease similar to diphtheria in that the streptococcus elaborates a toxin which is the causative agent, medical philosophers predicted that other investigators would soon reveal similar causative agents for related diseases. It appears likely that these predictions are to be realized within the current year. Now Ferry and Fisher report that they have elaborated a skin test for measles with toxin prepared from an organism found in the blood of patients suffering with this disease. Experiments are also being made with streptococci associated with erysipelas and puerperal sepsis and preliminary reports indicate the possibility of similar success.

Moreover, other organisms than the streptococcus are being studied with relation to toxin production, notably the staphylococcus and more recently the tubercle bacillus. If these investigations are confirmed, it may well be that the present decade will pass into history as the one that saw the streptococcus defeated by medical science. (Jour. A. M. A., Mar. 27, 1926, p. 955.)

PROGRESS IN THE STUDY OF THYROXIN*

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Eleven years ago, thyroxin was isolated in pure crystalline form. After the chemical structure of thyroxin had been established, two questions remained unanswered. The first is: What part of the molecule is responsible for the physiologic action? The second is: What is the relation between thyroxin and other substances which are involved in the processes of oxidation in the animal organism? In order to answer the first question it became necessary to produce thyroxin synthetically and also to make a series of closely related compounds. With these substances it was hoped that the mechanism by which thyroxin functions could be established.

The synthesis of thyroxin is a hazardous undertaking, and without any assurance that the compound could be made synthetically the work became an adventure in the field of pure organic chemistry. The reward for the synthesis, however, was a stimulus sufficient to insure the completion of the work. One difficulty with the synthetic preparation of thyroxin is the fact that the answer cannot be known until the objective is accomplished. It may be compared to the cornering of the wheat market in the business world. Until the crisis is over, one can never know that the wheat market has actually been cornered. The same suspense is experienced in the synthesis of any organic substance.

The synthesis of thyroxin has not yet been accomplished but I have recently secured evidence which confirms the structural formula assigned to thyroxin and have prepared a compound which is thyroxin in every detail except that 3 atoms of bromin are in the positions occupied by the 3 atoms of iodin. This substance, tribrom thyroxin, possesses chemical properties which are surprisingly similar to those of thyroxin itself, and the method of its preparation serves as a proof of the correctness of the formula assigned to thyroxin. Therefore, the only remaining problem connected with the synthesis is to prepare the substance containing the 3 atoms of iodin instead of the 3 atoms of bromin. I have advanced nearly to completion with this problem and am no longer concerned with the question as to whether or not it is possible to make thyroxin synthetically. It is possible to make it.

When thyroxin is administered to a person deficient in thyroid substance the production of energy is profoundly affected; it can be shown that thyroxin is responsible for 40 per cent of the basal metabolism. It therefore becomes evident that, if the mechanism responsible for the activity of the thyroid can be established, a key will be secured which can be used to explain the action of other substances.

During the synthetic work on thyroxin a series of new compounds with unique properties has been produced. This group of substances can exist in two forms: an oxidized and a reduced form. We now have evidence that thyroxin is a member of this group of compounds, and can therefore say that the physiologic action of thyroxin is due to the fact that the molecule can exist in these two states. The processes involved in the oxidation and reduction of thyroxin are linked inseparably with the mechanism of oxidation in the cells of the body which lead directly to the production of energy.

After it has been shown that the physiologic action of thyroxin is based on the alternate loss and acquisition of 2 atoms of hydrogen, the problem broadens to include the probable mechanism of the other substances which assist in oxidation. The first of these other compounds to receive attention was epinephrin. By working with a series of substances closely related to epinephrin, I have now shown in quantitative and convincing manner that the secret of the activity of epinephrin is the production within the molecule of a chemical grouping which is identical with the grouping responsible for the activity of thyroxin. Epinephrin can exist in an oxidized and a reduced form, and it fits into the process of oxidation in the cell in a manner which is very similar to the functioning of thyroxin. The close relationship between these two substances is shown by the following structural formulas which give the cycle of changes in the respective molecules.

The cycle of the chemical reactions in the thyroxin molecule when it functions as a catalyst, showing the formation of the nitrogen bond in the open-ring form, the closure of the pyrrolidone ring and reduction of the nitrogen bond.

The cycle of the chemical reactions in the adrenaline molecule when it functions as a catalyst, showing the formation of a bond through the hydrogen of the methyl amine group.

*From the Section on Biochemistry, Mayo Clinic, Rochester, Minnesota. Read before the Minnesota Academy of Medicine, Rochester, Minnesota, November 12, 1925.

It has been shown that thyroxin and epinephrin produce a profound effect on the rate of energy production of the body, but there are many other substances whose physiologic activity undoubtedly belongs to the same type of reaction. Among these are glutathione and, in all probability, vitamin B. A less important member, but of great theoretic interest, is bios. I have investigated glutathione and shown that it acts in essentially the same manner as thyroxin and epinephrin but at a much lower intensity. I am now engaged in studying the manner of functioning of vitamin B and bios.

From the work carried on thus far, it becomes evident that thyroxin is one member of a group of substances which affect the rate of oxidation in the animal organism. The action of thyroxin can be compared to the pressure or voltage in the electric light system. When you are running an automobile, the headlights are bright, but when you stop there is a perceptible dimming or a lessening in the amount of light produced in the electric light bulbs. The only thing which has happened in the electric light system is a lessening of the pressure or voltage. In a similar manner, when thyroxin is removed from a functioning cell in an animal organism, the intensity of oxidation is lowered, resulting in a decreased rate of oxidation, but no fundamental change in the essential process of oxidation. Restoring thyroxin to such a cell restores the functioning intensity or pressure of oxidation and the cell again increases its rate of metabolism, returning to a normal status.

CEANOTHYN NOT ACCEPTABLE FOR N. N. R.

Ceanothyn is the name applied by Flint, Eaton and Co., Decatur, Ill., to a liquid extractive prepared from the bark of the root of Ceanothus americanus (Jersey tea). Ceanothyn was recommended "for the control of hemorrhage, in surgical procedure, postpartum hemorrhage, pulmonary hemorrhage, epistaxis, and disturbed conditions during the menopause." The Council on Pharmacy and Chemistry found Ceanothyn unacceptable for New and Non-official Remedies: (1) because its composition is uncertain, (2) because no tests are furnished to control its identity and uniformity, and (3) because no satisfactory evidence for its therapeutic value had been submitted. (Jour. A. M. A., Mar. 20, 1926, p. 890.)

STUDIES ON POLIOMYELITIS: RESUME AND NEWER FINDINGS*

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Among the numerous questions concerning poliomyelitis, only one may be regarded as entirely settled: that the causative agent is a filter-passing virus. Little is actually known concerning the origin and nature of this virus. Flexner and Noguchi have cultivated small globoid bodies from poliomyelitic material with which they succeeded in producing poliomyelitis in the monkey, *Mecaccus rhesus*, on intracerebral inoculation. This result has never been corroborated so far as the production of the disease in monkeys is concerned.

Immunity in poliomyelitis, as Flexner has pointed out, does not follow injection of virus and develops only in man and the monkey as they recover from attacks of poliomyelitis. The anaërobic globoid bodies of Noguchi and Flexner, as Amoss has shown, have little or no immunizing power. Except for serum from convalescent human beings and monkeys, the work along these lines has given us nothing for the prevention or the specific treatment of this disease, and the use of such serum is obviously impracticable except in a few selected cases.

The discovery that typical poliomyelitis can be produced in the monkey with virus and filtrates of virus[2,5] was considered final in proving that bacteria of ordinary size had no etiologic relation to this disease. However, prior to that time, a somewhat peculiar diplococcus or streptococcus had been found in spinal fluid and in brain and cord, and in some instances injections in animals gave suggestive, although inconclusive, results. Since these early studies were made, special methods have been developed and bacteria of ordinary size have been isolated repeatedly from diseased tissues which were formerly considered sterile. The localization of these bacteria in animals frequently correspond to that of the lesions from which they were isolated. In view of the extremely specific effects obtained in my studies in elective localization, I considered the earlier investigations as inconclusive proof that bacteria of ordinary size had no etiologic

*From the Division of Experimental Bacteriology, The Mayo Foundation, Rochester, Minnesota. Read before the Minnesota Academy of Medicine, Rochester, Minnesota, November 12, 1925.

relationship to poliomyelitis; and accordingly, in July, 1916, I began to restudy the bacteriology of poliomyelitis by the use of the newer methods. I shall review briefly here the results obtained, in order to emphasize their significance and to report newer findings which bear closely on the etiology of poliomyelitis.

A pleomorphic streptococcus has now been consistently isolated from and demonstrated in affected tissues in all cases of acute poliomyelitis that have occurred in different epidemics and in widely separated parts of the country. The organism has been found in large numbers in adenoids and tonsils, in smaller numbers in lesions in various parts of the central nervous system, and in the mesenteric lymph nodes.[9] It has been proved to be absent in organs and areas showing no lesions. The organism shows great variation in size and shape, depending on the method of cultivation. In aërobic cultures, although more irregular in size, it closely resembles ordinary green-producing streptococci or pneumococci of low virulence. Under anaërobic cultivation, especially in tall columns of ascites fluid with tissue and oil, it attains a very small size,[11] becomes filtrable, and in many respects appears identical with the globoid organism described by Flexner and Noguchi. The variations noted in cultures have been proved not to be due to contaminations or to mixed cultures. All gradations in size between large coccus or diplococcus forms to exceedingly small, almost ultra-microscopic forms, have been found alike in cultures and in the tissues, and the conditions favorable for the formation of one from the other have been determined. Morphologic evidence of the breaking down of large forms into the small forms in the tissues has been obtained. Pure cultures of this organism have been isolated many times, even from filtrates of nasopharyngeal washings and freshly made emulsions of brain and cord from cases of acute poliomyelitis, and it has been demonstrated in films and sections of brain and cord many months after they were placed in 50 per cent glycerol. It is constantly present in the diseased tissues, from which it can be cultivated even after many months in glycerol. On injections of fresh cultures into young rabbits and guinea-pigs it localizes specifically in the nervous system and produces flaccid paralysis and changes in brain and cord, which resemble those of poliomyelitis in man.[12] From the brain and cord of these animals the organism can be isolated and the disease again produced. The organism has been rendered filtrable. By means of the same methods the identical organism has been isolated constantly from the brain and cord of monkeys paralyzed with fresh, glycerolated and filtered virus. The serums of human beings and of monkeys, after recovery of the animals from poliomyelitis, agglutinate specifically the more sensitive strains both from human beings and monkeys with poliomyelitis.[10] Injections of the recently isolated aërobic cultures into monkeys render them refractory to virus. The aërobic form of the organism from human beings and monkeys with poliomyelitis produces antibodies in the serum of horses, in a large amount common for both, cross-agglutinating these strains specifically in high dilution. This serum has been found in some instances, but not in all, to protect monkeys from paralysis following injection of virus and to neutralize virus in vitro. It has also been found useful in the treatment of poliomyelitis in man in a large number of cases.

The results of Flexner and Noguchi, so far as the cultivation of a small filtrable organism and its demonstration in the tissues in cases of poliomyelitis are concerned, have been corroborated, but the results of my experiments indicate that this is the anaërobic and, according to Amoss' results, a non-antigenic form of the organism which, under aërobic cultivation, clearly belongs to the streptococcus group of microörganisms. Both forms have been constantly demonstrated side by side and sometimes in the same chain, in the tissues in cases of poliomyelitis. The streptococcus occurs in places where virus has been demonstrated to be present: the nasopharynx, tonsils, lymph nodes and spleen, central nervous system and liver; and is absent where virus is absent: kidney, heart and lungs, spinal fluid, blood and urine. Flaccid paralysis, coming on soon after injection, has been produced in monkeys with characteristic although not typical changes in the cord with aërobic cultures, but the classic picture, as obtained with virus in this species, has not been secured. The rabbit and guinea-pig are highly susceptible to the streptococcus, the monkey highly resistant, while with virus the conditions are reversed. It may be suggested, on the basis of results obtained, that inability to produce typical poliomyelitis in the monkey with this streptococcus may be due to a relatively high natural immunity as well as to the develop-

ment of immunity, since the organism in the aërobic form has marked antigenic powers.

Similar results have been obtained consistently during different epidemics of poliomyelitis as well as in sporadic cases since 1916. Mathers and Nuzum and Hertzog obtained similar results, and Hektoen, Mathers and Jackson have also demonstrated the presence of this organism in the lesions in a series of cases of poliomyelitis. Through intracerebral inoculation of small amounts of suspensions of nasopharyngeal swabbing, I have been able to isolate the pleomorphic streptococcus consistently not only from the throats of persons ill with poliomyelitis but in contacts and normal persons at the time of epidemics, and have proved its absence in the throats of persons after recovery and in the throats of normal persons in the absence of epidemic poliomyelitis. Thus the throats of forty-four persons (nineteen patients with poliomyelitis and twenty-five normal controls) in whom the organism was demonstrated in the throat during the epidemic of poliomyelitis in 1921, were reexamined one year later when there were no cases of poliomyelitis. Flaccid paralysis was produced in rabbits, with recovery of characteristic streptococci, by material from only three persons. Similar results have been obtained during several additional epidemics since that time.

The demonstration of the presence of the characteristic streptococcus in throats by means of animal tests is a laborious task. The symptoms are not always characteristic, and specificity of the streptococcus, as measured by its agglutinating reactions, may disappear rapidly.

THE POLIOMYELITIS PRECIPITIN REACTION

Last year a simple method for proving the presence of the organism of poliomyelitis in the throat was evolved,[9] namely a precipitin reaction with the cleared nasopharyngeal extracts and the poliomyelitis antistreptococcus serum. In this study, a high incidence of positive reactions was obtained not only in cases of poliomyelitis (83 per cent) but also in normal contacts (77.5 per cent), in persons ill with various diseases (65 per cent), with scarlet fever (24 per cent), and in normal persons within the epidemic zone (59 per cent); whereas a uniformly low incidence was obtained in the three control groups outside the epidemic zone: persons ill with various diseases 4.8 per cent, with scarlet fever 9.5 per cent, and in normal persons 5.5 per cent respectively. Further studies with the precipitin reaction during the past summer in connection with three epidemic outbreaks, corroborate fully those obtained last year, and have extended our knowledge of the relationship of the streptococcus to poliomyelitis in important respects. It was found among other things, that as poliomyelitis appears in epidemic form this streptococcus becomes prevalent not only in the throats of persons ill with the disease but in throats of persons generally, and as the epidemic disappears, the organism likewise disappears. Thus, the precipitin reaction in 102 persons swabbed prior to the occurrence of the first case in Rochester, including two families in which one child of each had abortive poliomyelitis, was positive in only fourteen, whereas during the period of the epidemic the incidence of a positive reaction averaged 70 per cent of 632 persons swabbed. During the three weeks following the occurrence of the last case, in only 13 per cent of 265 persons swabbed were reactions positive. Similar results were obtained in persons in whom the test was made before, during and following the epidemic. The results in family groups in isolated rural districts in which no case of poliomyelitis developed and in which contact could not be determined, were of particular interest. A high percentage of positive reactions was obtained in these at the time of the epidemic, whereas several weeks after the epidemic had disappeared, the precipitin reaction was nearly always negative. In a number of instances, all persons in families that had left the epidemic zone before poliomyelitis appeared and who returned during the epidemic reacted negatively and even those who had no direct contact with other persons, reacted positively within five to seven days after their return. It was also found that the precipitin reaction in persons who had had poliomyelitis previously and whom we knew to be immune to a second attack, was usually positive during the epidemic and negative after the epidemic had subsided. The prevalence of this streptococcus, even in the throats of persons who have recovered from poliomyelitis, at the time of epidemics, suggests strongly that to prevent poliomyelitis in the susceptible, it will be necessary to find a method of specific immunization. The incidence of the disease indicates clearly that certain children are naturally immune and that, through abortive attacks or otherwise, a large percentage of the population becomes immune with increasing

age. The need, therefore, for a method to determine susceptibility is very great. Attempts along this line have been made from time to time, but until recently without success.

SKIN TEST

In preliminary tests with various antigens it has been found that strains of the streptococcus freshly isolated from poliomyelitis and which produced flaccid paralysis in rabbits, yield suitable toxic antigens when grown for twenty-four hours in pancreatic digest broth to which approximately 10 per cent of ascites fluid is added at the time of inoculation. The culture is sterilized by adding 0.5 per cent phenol or cresol. It was found that 0.1 c.c. of a 1:100 dilution in sodium chlorid solution of the killed culture injected intradermally, approximates the optimal dose. Absence of redness at the point of injection of the test substance at the end of from eighteen to twenty-four hours is considered as negative, redness limited to the area injected is recorded as +, redness extending beyond the blistered area approximately 1 cm. in diameter, as ++, redness from 1 to 2 cm. in diameter, as +++ and larger areas usually from 2 to 3 cm. (more rarely 4 cm. in diameter), as ++++. The reactions of + and ++ are considered as mildly positive and those of +++ and ++++ as strongly positive. The control injection consists of a dilution of 1:100 of the corresponding uninoculated broth. This has always given negative results or only slight redness limited to the area blistered at the time of the injection.

Thus far, the skin test has been made on twenty-eight persons who had recovered from attacks of poliomyelitis from four weeks to years previously. Of these, twenty-one gave a negative reaction and seven a mildly positive reaction. All of three patients with poliomyelitis gave strongly positive reactions during the acute attack, while two of these reacted negatively a month later. One gave strongly positive reactions on the third day of illness, mildly positive reactions eight days later, and negative reactions four weeks after the onset of the attack. Nine persons, mostly children, who had what was considered abortive attacks of poliomyelitis during the recent epidemic, were tested from five to eight weeks later. Six gave negative and three mildly positive reactions. The results in controls, chiefly in family groups in whom no illness suggestive of poliomyelitis had occurred, were as follows: strongly positive in twenty-five cases, mildly positive in eighteen, and negative in seventeen. Of forty-five children from five to ten years of age at an orphanage, 73 per cent gave a strongly positive reaction, and of the remaining thirty-one children from eleven to sixteen years of age, 45 per cent gave a strongly positive reaction. Of ninety-eight high school pupils ranging from fourteen to nineteen years of age, only 28 per cent gave a strongly positive reaction.

The incidence of a positive skin reaction according to age, therefore, judging by these preliminary experiments, corresponds in general with the age incidence. In some instances persons with marked residual paralysis have reacted negatively to undiluted cultures to which those highly susceptible reacted positively in dilutions as high as 1:1000. The skin reaction with the poliomyelitis antigen appears specific, the incidence of positive reactions with similar antigens prepared from other strains appears as high in persons that have recovered from poliomyelitis as in normal controls. The skin of most rabbits has been found susceptible while the skin of seven monkeys of the species *Mecaccus rhesus*, of five Java monkeys and two baboons, has been found insusceptible, results in agreement with the difference in susceptibility of these animals to infection by the streptococcus.

Numerous questions regarding the nature of the reaction have not yet been worked out. However, the immune serum prepared with the pleomorphic streptococcus, which has been used successfully in the treatment of the early stages of poliomyelitis, has marked neutralizing power over the toxin, as determined by the skin reaction. Further work is in progress.

BIBLIOGRAPHY

1. Amoss, H. L.: The cultivation and immunological reactions of the globoid bodies in poliomyelitis. Jour. Exper. Med., 1917, xxv, 545-555.
2. Flexner, Simon, and Lewis, P. A.: The transmission of acute poliomyelitis to monkeys. Jour. Am. Med. Assn., 1909, liii, 1639.
3. Flexner, Simon, and Noguchi, Hideyo: Experiments on the cultivation of the microörganism causing epidemic poliomyelitis. Jour. Exper. Med., 1913, xviii, 461-485.

4. Hektoen, Ludwig; Mathers, George; and Jackson, Leila: Microscopic demonstration of cocci in the central nervous system in epidemic poliomyelitis. Jour. Infect. Dis., 1918, xxii, 89-94.
5. Landsteiner, K., and Levaditi, C.: La transmission de la paralysie infantile aux singes. Compt. rend. Soc. de biol., 1909, lxvii, 592-594.
6. Mathers, George: Some bacteriologic observations on epidemic poliomyelitis. Jour. Am. Med. Assn., 1916, lxvii, 1019.
7. Nuzum, J. W., and Herzog, M.: Experimental studies in the etiology of acute epidemic poliomyelitis. Jour. Am. Med. Assn., 1916, lxxii, 1205-1208.
8. Rosenow, E. C.: Etiology of epidemic poliomyelitis. Jour. Infect. Dis., 1918, xxii, 281-426.
9. Rosenow, E. C.: A specific precipitin reaction in epidemic poliomyelitis. Jour. Am. Med. Assn., 1925, lxxxiv, 429-432.
10. Rosenow, E. C., and Gray, Hazel: Agglutination of the pleomorphic streptococcus isolated from epidemic poliomyelitis by immune horse, human, and monkey serum. Jour. Infect. Dis., 1918, xxii. 345-368.
11. Rosenow, E. C., and Towne, E. B.: Bacteriological observations in experimental poliomyelitis of monkeys. Jour. Med. Res., 1917, xxxvi, 175-186.
12. Rosenow, E. C., Towne, E. C., and v. Hess, C. L.: The elective localization of streptococci from acute poliomyelitis. Jour. Infect. Dis., 1918, xxii, 313-344.

SAFEGUARDING THE PUBLIC

A hearing recently was held in New York state on a new bill which not only provides for registration of all duly licensed practitioners but requires annual reregistration, to be kept by the board of regents and to be available to medical and health agencies in every county. This will allow a check-up on all physicians in the state every year and those deemed unworthy will not be reregistered.

To make the penal provisions of the bill more effective, it transfers the prosecuting duty from the county district attorneys to the attorney general and places such cases in the Courts of Special Sessions.

Another safeguard is the establishment of a Grievance Committee which is charged with the duty of sifting evidence as to unprofessional and illegal practices on the part of licensed physicians and of submitting recommendations to the Board of Regents as to the revocation of such licenses. The Grievance Committee is to be appointed by the Board of Regents, in part, after suggestions from the State Medical Societies.

The next Minnesota legislature will do well to consider this bill. Such an act is needed in this state where the abuses of quacks and unethical licensed practitioners are becoming more flagrant. The reregistration and other features of the bill would go a long way toward correcting this evil.—*Northwestern Health Journal*, March, 1926.

CYSTS OF THE THYROGLOSSAL DUCT*

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I have been asked to speak tonight about an operation which we have used for a few years in operating on cysts and sinuses of the thyroglossal tract. The results obtained by this type of operation have been very much more satisfactory than by any previous method which we have used in operating for this condition.

Very early in fetal life the thyroid gland develops at the base of the tongue and descends in the median line of the neck to its normal position. Normally, the epithelial lining of the tract through which the thyroid descends becomes obliterated. If this fails to occur, cysts may develop along its course.

The diagnosis of cyst or sinus of the thyroglossal duct is, as a rule, not difficult and it is made by recognizing a rather firm cystic tumor or a sinus in the median line of the neck usually near the hyoid bone or the tip of the thyroid cartilage. Occasionally, however, a cyst or a sinus tract may be found in the median line as low down as the sternal notch. Usually, the duct, which runs from the cyst to the hyoid bone, may be easily palpated.

The highest percentage of cures is obtained when the entire epithelial-lined tract is removed. As a rule, the cyst and the portion of the tract lying below the hyoid bone may be dissected out without difficulty, but above the hyoid bone the tract is so small and friable that it is broken off easily and consequently is difficult to remove. Many recurrences come through failure to remove the portion of the epithelial-lined tract which passes through the tongue to the foramen cecum.

The operation is usually performed through a transverse incision about 5 cm. long across the neck at the level of the hyoid bone. The skin and platysma muscles are reflected. The cyst is usually found lying underneath the raphe connecting the sternohyoid muscles. It is dissected free up to the hyoid bone. At this point the tract usually passes above, below or through the hyoid bone and, for this reason, a small portion of the center of the hyoid bone is removed; then, no attempt being

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made to isolate the duct, the tissues are cored out through the muscles of the tongue directly to the foramen cecum, and the duct with the tissues surrounding it for a distance of about 3 cm. on each side is removed. In doing this, it is necessary to keep clearly in mind the course of the thyroglossal duct. This corresponds to a line drawn at an angle of 45 degrees backward and upward through the intersection of lines drawn horizontally and perpendicularly to the superior central portion of the hyoid bone. The removal of the portion of the duct lying above the hyoid bone may be more easily accomplished if the tongue is pulled upward after the segment of hyoid bone has been removed and a finger is introduced into the mouth in such a manner as to push the foramen cecum upward and forward toward the hyoid bone. The foramen cecum may be located through following the two rows of circumvallate papillæ which lie on each side of the tongue; these join in the median line just anterior to the foramen cecum. By pushing the foramen cecum forward the distance between it and the hyoid bone is considerably shortened, and the finger acts as an excellent guide to prevent entrance to the pharynx during the dissection.

In the dissection, the duct, a portion of the hyoid bone, a portion of the raphe joining the mylohyoid muscles and a portion of the geniohyoglossus muscles are removed and the dissection is carried up to the mucous membrane of the tongue covering the foramen cecum, at which point the duct is cut off. The opening in the geniohyoglossus muscles is sutured with interrupted catgut sutures, and the tissues surrounding the cut ends of the hyoid bone are brought together with chromic catgut sutures in such a manner as to approximate the edges of the bone. A small rubber tube is introduced to this point and the skin closed.

Since this type of operation has been employed in the Clinic, all of the patients operated on, so far as I have been able to ascertain, have been cured, whereas previously operative procedures often failed to effect a cure.

DISCUSSION

Dr. Arnold Schwyzer, St. Paul: I think this is a very good procedure, only I am surprised that the Doctor said there were so many failures before. I have operated on a number of these; they were thyro-glossal duct fistulæ and a few cysts. When you come up to the hyoid—if you know what these cysts and fistulæ are due to—you also know it is very probable that the tract runs further on.

For a good many years I took out a part of the hyoid bone in these cases and followed the cord-like tract up into the tongue, at times practically to the mucosa.

One of my assistants not long ago noticed on his own neck what he thought was a lymph gland. He is about forty-five years old. When we started to remove the thing, we did not think it was anything else than a lymph gland; it turned out to be a cyst connected with the hyoid bone. We operated under local anesthesia. The hyoid bone was resected and the tract followed clear to the mucosa of the tongue. It came natural to try to get the tract out in its entire length. Taking some of the surrounding tissue gives you a chance to pull; the tissues then hold.

In my work I did not always go as far as the Doctor stated, but I must have been lucky. Not all the cases seem to exactly need this thorough procedure. There is, however, no question but what the method described by Dr. Sistrunk is the proper way to operate on these cases.

April 14, 1926.

To the Editor:

I have gone over the article on Copenhagen Snuff (editorial, this issue) and find it covers the ground. The North Dakota Agricultural Bulletin, September, 1913, gives a complete analysis of the ash of Copenhagen and Right-Cut tobacco, and I find they agree fairly closely. The amount of nicotin in these products showed a higher per cent than the Fine-Cut tobacco, tobacco leaves and Stag Smoking tobacco, which they analyzed, 1.3, 1.94 and 1.69 per cent, respectively. The percentages of nicotin in two samples of Right-Cut were 3.49 and 3.75, respectively, and in Copenhagen, 3.27 per cent. I give you this in case you may not have seen this Bulletin. * * *

Since there is a general sentiment against legislation which some people feel is taking away their liberty or rights as they consider it, I am of the opinion that more can be accomplished by education than by force. Articles of the nature of this editorial, coming from the medical profession which does not pose as critics, and are not seeking notoriety or public favor, will carry weight and give food for thought which I feel cannot be accomplished by legislation.

If this editorial were copied and published in the daily press, it would surely attract attention, especially by the users of snuff, and they would not look upon it as propaganda against what they consider their rights. If they have ordinary intelligence, they should profit by the knowledge imparted; if not, society will not miss them when they are gone.

Sincerely yours,

E. D. Brown.

SURGERY IN THE HOME*

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A paper on surgery in the home at the present stage of evolution when almost every small town supports a well equipped hospital and when nearly every farmer owns at least a Ford, seems rather unnecessary to present to a body of physicians such as this, and in responding to the request of the committee to give something along this line, I thought the relating of some of my early experiences of work done in the home and an account of one or two later cases might be of interest to at least the younger members of the profession who have never been without help of some kind and have always had at their command an up-to-date hospital.

Let me recount hastily the status of medicine in 1882 when we were turned loose to practice our profession on an unsuspecting public. Medicine looked at from our present status was then seemingly in its infancy. It was the time when aseptic surgery was unknown, laudable pus was the great desideratum, and a laparotomy was practically never done. Never during my three years at Rush did I witness an abdomen opened. The germ theory of disease was just beginning to be accepted and it was the proof that suppuration of wounds was the result of microbic infection which made the great turning point in the history of surgery. Then came antiseptic surgery for a period with its carbolic acid spray at the site of the operation while the surgeons operated in their every-day clothes, all this giving way in time to today's aseptic surgery.

It was a time when in chemistry the raising of bread by yeast was thought to be a chemical process, when the elements numbered about seventy instead of ninety-two, when the atom was an indivisible particle of matter and not, as we now know it to be, a simple manifestation of electricity, a little universe in itself, a nucleus surrounded by its attendant satellites. The cause of tuberculosis was unknown and it was at a much later date that the cause of puerperal fever from which thousands of mothers died annually was discovered and its prevention adopted. Likewise the causes of diphtheria, typhoid, yellow fever and malaria and the long list of germ diseases of today were not known.

We had to fight these terrible diseases as best we could while we constantly exposed ourselves to their infectiousness. We, who are country practitioners, are apt to deplore being handicapped in our early practice by reason of lack of resources in our armamentarium, but as I look back at it all now I cannot but feel that many of the disappointments and predicaments that were forced upon us were blessings in disguise. We were forced to be more resourceful. We had to have more initiative and we became more skillful by reason of our experiences. We had to think as conscientious physicians, there was a life at stake, and there was no help but ourselves. We early saw that to do anything but the simplest surgery we had to have help and fortunately this predicament being forced on the three physicians then located in our town, we agreed to assist each other in any of our cases. We undertook and performed operations that otherwise would have been impossible and the result was that we saw more surgery, we talked more surgery and did more surgery. Our practice became more profitable. There was a more friendly feeling between the physicians and there was less gossiping amongst the laity.

It has been said that any successful business is the reflection of some one mind, and so, in surgery, one head should direct, one should command. And when one develops the surgical sense of cleanliness by always practicing it, no matter where he is he can find ways and means to practice aseptic surgery. If forced to do major surgery in the home, there is usually some one room that can be used by disrobing it of its many chromos, its shades and curtains, flower pots and furniture, wetting and mopping up the floor, while the family boiler will sterilize your paraphernalia, even your instruments, if necessary. To those willing helpers, the neighbors, who are always present there should be issued the injunction of "hands off" except for the crudest work.

It was in this way that all of our early surgery was done. Not according to the accepted technic of today, for that is the acme of forty years of evolution. Those early experiences show that good

*Read before the Annual Meeting of the Northern Minnesota Medical Association, Brainerd, Aug. 24-25, 1925.

surgery can be done almost anywhere if you take great pains.

My first appendix case was thirty years ago, twelve miles in the country, on a lad of thirteen years. I was all alone save a drayman, who held the ether can. My intention was to remove the appendix, but an abscess had formed and I was scared out, fortunately for the boy, for he recovered and is now forty-three years old. Nevertheless, my reputation spread as having done something great.

Another early case which I will not forget was when forced to do a hysterectomy after making the mistake of passing my instrument through a cancerous fundus uteri. Visions of peritonitis and rapid death associated with a malpractice suit scared me not a little. I had always known of the danger of doing just this but never thought it could be so easily done. Hastily summoning Doctors Parrott and Van Valkenburg from our town to assist me, we did an hysterectomy on the kitchen table which resulted in the patient's recovery. She lived about one year and eight months and enjoyed fair health for that length of time.

Another similar case in the early days was a Mrs. M., operated on in her home for cancer of the cervix involving the upper part of the vagina, in which a pan-hysterectomy was done, removing, also, the upper part of the vagina. The patient recovered, became apparently well, was able to do her own shopping, but finally died after two years.

Our gallbladder cases were simply drained, for this was the custom of the day and the more stones we removed the greater surgeons we were.

Over thirty years ago, before the telephone connected our town with surrounding villages, I received a telegram from an itinerant preacher and would-be doctor to "Come at once to Clarissa child born, no colon." Knowing the doctor by reputation I figured that instead of its being a colon it was a period that was missing and that it was an imperforate anus that we had to deal with. Expecting to have a little help I was rather surprised not to have the doctor show up, so, hastily placing the baby before a west window, for the sun was about to set, we gave but a few drops of chloroform and then turned that part over to a neighbor woman to give as directed. The baby was in extremis, greatly bloated, evidently in great misery and almost constantly vomiting. There was absolutely nothing external as a guide in making the incision except the vagina, but by keeping close to that and dissecting upwards for a half to three quarters of an inch I came to the bowel, which was fortunately distended like the rest of the canal. On incising the bowel there was a rush of fecal and gaseous discharge which was a wonderful relief and the baby was almost immediately at rest. I attempted to bring down the gut but gave that up. Dilators were used on this case for a period of two or three years, but there has never been any trouble since that time. She is still living, twenty-six years old, and has a family of five children. The points of interest in this case are: first, that a baby could live nine days with no passage of the bowels, and that the condition had not sooner been discovered; second, the fortunate distention of every part of the canal undoubtedly made it easier to find the bowel; third, although both internal and external sphincter muscles had undoubtedly been cut, possibly twice, she has perfect control of the bowels. Statistics show that imperforate anus occurs about once in 50,000 births, indicating the rarity of the condition.

A CASE OF OBSTRUCTED BOWEL OCCURRING IN THE PRACTICE OF DR. C. E. REEVES

In 1917, Dr. C. E. Reeves of Eagle Bend, Minn., was called in the country to see one Anton H., thirty-five years of age, who was suffering great abdominal pain. Unable at the time to diagnose the case, the man was given morphine hypodermically. The next day, toward night, the pain returning, he was brought to the doctors' hospital in Eagle Bend, where he passed the second night. I first saw the patient the next morning, about thirty-six hours after the beginning of the attack. We found the patient vomiting, in great distress, and presenting a hard tense tumor-like mass in the lower abdomen, extending as high as the umbilicus. There had been no bowel movement, although the usual enemas had been given. Temperature was normal, pulse 126, skin cold and clammy. He was placed on the table, etherized, and a median line incision made. Immediately there was an escape of distended black and gangrenous bowel which, when delivered, covered the whole abdomen. My first thought was to puncture the bowel, allow the gas to escape and then crowd the bowel back and sew him up, as it seemed like a hopeless task to

remove such a mass, but on second thought we realized that would indeed be a cowardly act and so concluded to go ahead and do what we could, regardless of results. There seemed to be bowel everywhere and it was with the greatest difficulty that we were able to get down to the obstruction. We found it impossible to see the obstruction, but there was seemingly a hard, firm band forming a loop that the bowel had passed through. It was only by considerable pressure that I was able to force my finger partly through the constriction sufficiently to release the bowel. To make matters worse, the bowel had perforated and some fecal discharge was present in the right iliac fossa. This area was cleaned out and packed away from the balance of the field. After finding healthy bowel, a side-to-side anastomosis was made, the mesentery was sewed over and over with back stitching on the line of demarcation and ten feet of bowel removed. The usual abdominal toilet was made with rubber drainage from the right iliac region, and the patient was returned to bed. In order to determine how much bowel had been removed and not having a tape line or measuring rule, I held the bowel up at its middle point by a pair of forceps so that the two open ends would be hanging down and even. By holding the forceps on a level with my collar button, the two open ends just reached the floor, a distance of over five feet. In our hurry to get through we had no time to investigate the nature of the constricting band, nor did we find out just what part of the small bowel had been taken out. He had a rather stormy convalescence at first, but, on the whole, satisfactory. Dr. Reeves attended him entirely and could give the details of his convalescence. I intended to report this case soon after recovery took place, for up to that time I had not noticed any report of more than eight feet of intestine having been removed with recovery. But I understand that the American Medical Association Journal, answering a question as to what is the largest amount of bowel ever excised with recovery, cited a case where twenty-one feet had been removed. Both Dr. Reeves and myself thought this man would die from lack of nourishment, even if he survived the operation, but I understand he is as physically fit as he ever was. I believe he was arrested not long ago by Sheriff Burns of our town for bootlegging, so we didn't do so very much after all. There were present at this operation, Mr. Landeen, the druggist at Eagle Bend, who gave the ether, Dr. Reeves and his wife and myself.

On August 2, 1922, O. A., forty years old, investigated the cause of a breakdown in the electrical system at Long Prairie, following a storm. While standing on the wet cement platform at the base of a transformer, he raised his right arm to point out the trouble and immediately there was a flash of electricity and 32,000 volts passed through his body to the ground. He was put into a truck by an assistant and brought to the hospital at once. The man was crazy from pain and had to be held. Two hypos of morphine were given with apparently no effect before he was put under ether. His right arm had evidently been sufficient to form an arc, for we found the arm burned through and through as far as the shoulder, while the crown of his head had received the balance of the discharge, matting his cap and hair down into a solid adherent mass. From these points the flash had evidently spread out, covering the neck and upper part of the chest. There were no burns on the lower trunk or on the legs, but both feet and ankles were badly and symmetrically burned. On the bottom of the heel of each foot there was a hole a half inch in diameter extending through the skin only, but completely burned out. The condition of the man was so distressing and the surface to be treated was so extensive that carron oil, being at hand, was applied on non-absorbent cotton instead of the paraffin that we usually use. Later, a well diluted antiseptic ointment was used. Immediately on coming out from under the effects of the ether the patient, much to our surprise, was rational, the brain, notwithstanding the terribly deep burn on the crown of the head, evidently not having been damaged. Later, we found the whole outer table of the skull over an area seven inches in diameter had been destroyed. The right arm was amputated at the shoulder joint on the third day. This area healed very satisfactorily, but the electrical burns were much slower in healing than if caused by hot water or fire. They are similar but less severe than the *x*-ray burns. The surrounding tissue looked healthy to the naked eye, but we found it devitalized and slow to come back to the normal. To hurry over this case, the arm healed completely in three weeks as did the burns on the face, neck and shoulders. It was two months before the feet were healed, as the burns were deep, and it was over a month before we could

separate the scalp from the burned bone underneath. The man went back to work in three months and has been working ever since. He was well and able to work except for the fact that he had been completely scalped, a circle seven inches in diameter with nothing but the burned skull remaining. In this condition his head was dressed daily with moist boric acid solutions for some time. In order to hasten the reparative process here, small eighth-inch holes a quarter inch apart were bored through the outer table of the skull, avoiding the longitudinal sinus, in the hope that new tissue with good circulation would fill the holes and thus help more quickly to separate the devitalized from the good bone. Considerable of the dead bone was removed later on with chisels, leaving a raw surface below. After all dead bone had been removed I made the proposal of skin grafting, but as that would necessitate his giving up his work of superintending the electric system along the Great Northern he would not hear to it and so this has been dressed daily, trying different applications, and we found that the progress was better under a mild antiseptic vaseline than under any other preparation. There still remains a small circle not healed, possibly one and a quarter inches in diameter, which is slowly closing in.

This case differs from all cases of avulsion of the scalp that I have seen reported in the literature, in that instead of good bone, we had charred and dead bone to deal with. Then it is interesting in that the brain apparently did not suffer after receiving such a heavy discharge of electricity on the top of his head. He was at all times rational after the first dressing. It is also interesting that with such a heavy electrical discharge no internal vital organ suffered and that the bones of the ankles and feet, which were horribly burned, were not injured. It is also interesting to know that the area denuded was closed or will be very soon without resorting to skin grafting. It was a long drawn-out case, lasting three years, but he was only away from his work three months.

When it is remembered that numbers of lives have been lost by simply standing on a wet pavement or in a bathtub and receiving the discharge from an incandescent light of 110 volts, it seems short of the miraculous (although I do not believe in miracles) that he should escape with life with 32,000 volts passing through him.

MERCUROCHROME IN ACUTE INFECTIONS ON THE CENTRAL NERVOUS SYSTEM*

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St. Paul

In reviewing the literature of the past year or two with special reference to the use of mercurochrome, one is impressed by the absence of testimony concerning its use in infections of the central nervous system. Its widespread surgical use with the brilliant results claimed for it would lead one to believe that it might also be useful in intra-cranial infections. However, this fact has apparently not impressed itself upon the profession at large, for very little can be found published upon this subject. Scattering articles here and there with reports of a case or two giving various results are the most that can be found. It is my purpose to set forth briefly the results of our own experiences along this line, citing two or three cases, and to give the conclusions which we have drawn therefrom.

In the first place, we have limited our use of mercurochrome to the usual dosage of five milligrams per kilogram of body weight, and have given it intravenously in a 1 per cent solution. We have not attempted to use it by injection into the subarachnoid space, either in the lumbar region or in the cisterna magna. Our technic has been the usual technic of any intravenous injection, giving it into one of the veins of the forearm, injecting it very slowly, taking approximately three minutes for the injection of ten or fifteen c.c. of the solution. We have never seen any untoward effects as a result of the injection other than the usual reaction which occurs in the use of this drug.

Considering first the intravenous use of mercurochrome in acute cases of epidemic encephalitis, we have not been able to see any satisfactory results. Following the reports of Young and Hill, with the eminently satisfactory results they obtained by its use in septicemia and the blood stream infections, we felt that it was worthy of a trial in encephalitis. The absence of a known causative organism as well as the absence of a positive blood stream infection in this disease made us a little skeptical as to its efficiency. Encephalitis is a localized process involving a greater or lesser portion of the brain, as

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the case may be, with a profound toxemia, producing greater or lesser effects upon the patient. Because a drug is an effective germicide and will definitely kill organisms when injected into the circulating blood, it does not necessarily follow that it will produce a curative effect upon some inflammatory process which is localized in some one organ of the body. Our results in its use in encephalitis have borne out this theory. We have used it repeatedly with absolutely no beneficial effect to the patients. They have had a chill with a rise in temperature, sometimes as high as 104° within an hour or two following the injection. This reaction has gradually subsided and there has been no apparent change in the condition of the patient. Secretions have shown that the drug is excreted through the kidneys and bowels, but we have not been able to demonstrate it in the saliva or in the spinal fluid. Bunten and Whitman reported salivation and Guy reported stomatitis following the intravenous use of mercurochrome, but we have not seen any toxic effects with a single exception of one or two instances of diarrhea, lasting for a few hours.

Contrary to our results, John W. Vischer reports two cases of epidemic encephalitis in which marked improvement was noted following the use of mercurochrome intravenously. He used a dosage less than that recommended by Young and Hill and less than that used by us. He feels as a result of his observation of these two cases that a more extensive trial of this method of treatment is warranted. His two cases are the only ones mentioned in the literature of the last year in which improvement occurred. Dr. Nels Werner of Eau Claire, Wisconsin, has informed me personally that he used this treatment in two cases of acute epidemic encephalitis with very definitely beneficial results. In commenting upon the difference in results obtained by these two colleagues and those obtained by ourselves, one or two possibilities are suggested. There is first the possibility that a true encephalitis did not exist. One can imagine an active infection in the blood stream giving a toxemia which would produce exactly the symptoms of epidemic encephalitis and which would yield immediately to the mercurochrome treatment as reported by Young and Hill. It is difficult to conceive of a true encephalitis with actual inflammatory involvement of the brain, making such startlingly rapid improvement following a single injection of any medication. On the other hand, granting that a true encephalitis did exist in these cases reported, it is possible that the causative organism belonged to a different strain than that of our series. The bacterial side of this subject is so vague and unsatisfactory that scientific explanation upon the difference in results obtained by different clinicians cannot be given.

Following our failure to get results in the treatment of encephalitis we determined if possible to try mercurochrome treatment in infectious meningitis, where we could determine the causative organism and study its effect by comparative spinal fluid studies. Accordingly, in May, 1925, we made use of it on a series of meningitis cases, occurring secondary to middle ear infection and I wish to report herewith three of those cases which will typify the results obtained.

Case 1. A schoolgirl, fourteen years of age, referred by Dr. Charles Connor of St. Paul, was admitted to the hospital April 16, 1925, with pain in the right ear and a temperature of 100° and pulse of 82. She was attended by Dr. Connor, who pronounced it an acute otitis media. On the 18th of April at 7 A. M. she had a chill with a rise of temperature to 104°, pulse of 120, with a good deal of pain in the head and back of the neck. We were asked to see her at this time and made a spinal puncture which showed a cloudy fluid; cell count 8,224 per c.m.n.; 63 per cent p.m.ns. and 37 per cent lymphocytes. The smear showed no bacteria and the culture gave no growth. Leucocyte count at this time was 25,200; 89 per cent p.m.ns. and 11 per cent lymphocytes. There was some improvement following the spinal drainage, which was repeated on the 19th and 20th. On the 21st she was given her first injection of mercurochrome, being given 20 c.c. of a 1 per cent solution intravenously. One hour and ten minutes after the injection she had a severe chill, lasting ten minutes, with a rise of temperature to 105°. In about two hours the temperature dropped to 100.8. A lumbar puncture performed at this time showed the spinal fluid to be unchanged. There was no coloration from the mercurochrome, though both urine and feces were definitely stained. On the 22nd, the mercurochrome was repeated in the same dosage and followed again by a lumbar puncture with the same results. The punctures were made following the injection to try and promote the passage of the mercurochrome solution from the blood stream into the cerebrospinal fluid, similarly to the procedure in the treatment of cerebro-spinal syphilis with salvarsan. On the 23rd of April, another injection of mercurochrome was given and was followed by a chill and rise of temperature, but the spinal fluid showed no stain. It was then thought best to give no more mercurochrome for a time as it did not seem to be benefiting the patient and we feared a toxic reaction. Accordingly, the usual spinal drainage was continued every twelve hours. The patient grew steadily worse and died at 2:30 P. M., April 26. Repeated cultures from the spinal fluid showed no growth, so it was not possible to isolate an organism in this case. There was no special reduction

in the cell count in the spinal fluid as a result of the mercurochrome treatment, and no special clinical improvement.

Case 2. A schoolgirl, eleven years of age, referred by Dr. M. W. Wheeler of St. Paul, was admitted to the hospital April 18, 1925, with a provisional diagnosis of staphylococcus meningitis, secondary to an acute left labyrinthitis. She had had a discharging left ear for two years, following scarlet fever, and had been operated on for a left mastoiditis about a year before admission to the hospital, without relief from the discharging ear. The spinal fluid examination the day of admission showed no bacteria but a cell count of 6,400, 30 per cent p.m.ns. and 70 per cent lymphocytes. The culture showed staphylococcus. On the 19th of April, she was given 20 c.c. of a 1 per cent solution of mercurochrome intravenously followed by drainage of the spine. About an hour after the injection she had a chill followed by a rise in temperature to 103.2. On April 20 she was given another injection of 20 c.c. of a 1 per cent solution of mercurochrome, followed by a spinal drainage. She had a chill lasting one-half hour with a rise in temperature to 104.2. Following this treatment there was very free bowel action and both urine and feces were stained red, but there was no staining of the spinal fluid. On April 21, another injection of the same dosage of mercurochrome was made, followed by spinal drainage, and again there was a chill lasting 30 minutes with a rise in temperature to 104°. Because of the apparent toxic diarrhea with intense staining of the stools, there was no more mercurochrome given until April 24, when a 20 c.c. injection of 1 per cent solution was given followed by a spinal drainage. At this time it appeared that this patient was improving under the treatment. She seemed brighter, more comfortable, more rational, and better in every way. However, in this respect she did not differ from other cases of septic meningitis in which repeated spinal drainage have been performed without the use of mercurochrome. Because of the fear of toxic results no more mercurochrome solution was given. The patient's condition remained about the same until April 28, when she became rapidly worse and died on the 29th. There was no apparent immediate effect in this case following the use of mercurochrome other than the chill and rise of temperature which followed the injection. The spinal fluid showed no changes as a result of treatment and the course of the case was not especially different from that of other cases, in which mercurochrome was not used.

Case 3. A schoolboy, thirteen years of age, referred by Dr. H. P. Ritchie of St. Paul, was admitted to the hospital April 19, 1925, with a temperature of 104° and entirely irrational, a very definite clinical case of septic meningitis following a middle ear infection of about ten days' duration. The spinal fluid examination showed a cloudy fluid with a cell count of 8,000; 60 per cent p.m.ns.; 40 per cent lymphocytes. The smear showed no bacteria, but a culture showed a pure growth of pneumococcus. An immediate injection of 25 c.c. of a 1 per cent mercurochrome solution was given intravenously. It was followed in about an hour by a slight chill, but no further rise in temperature and with no effect upon the patient. The next day this injection was repeated followed by spinal drainage, with positively no effect upon the patient. The urine and feces were stained but the spinal fluid showed no change. In view of the fact that the mercurochrome was producing no result, it was decided to discontinue it and anti-pneumococcic serum was given intravenously and intraspinally. This also produced no result. The patient died on April 21, not having responded to treatment in any way. In this instance mercurochrome was apparently useless.

Time and space do not permit the recital of any further cases, but the above are typical and illustrate both the use and effect of mercurochrome as we have found it to be. The question arose in our minds as to the value of a mercurochrome solution introduced directly into the cisterna magna, where its circulation in the sub-arachnoid space and through the ventricles of the brain would be assured. Ayer of Boston, in his splendid research in the field of spinal fluid, has demonstrated that circulation from the cisterna magna is much more free and diffuse than it is from the lumbar region. Therefore, we considered the injection of mercurochrome solution into the cisterna magna in these cases mentioned, but decided against it. Following the fatal outcome of all our cases we decided that at the next opportunity we would try it in the cisterna magna. That opportunity has not yet presented itself. Contemplating the writing of this paper we wrote a personal letter to Dr. Ayer requesting his opinion as to the efficiency of mercurochrome in acute infectious processes involving the central nervous system. He replied that he had tried it out and considered it of no value whatsoever and said that his results coincided exactly with our own. He stated furthermore that in one extreme case of septic meningitis he had injected into the cisterna magna a 1 per cent solution of mercurochrome. Death followed in twenty minutes from respiratory paralysis and Dr. Ayer said he felt that the drug probably played a part in producing this paralysis.

Following the brilliant reports of Young and Hill and the equally brilliant reports of some others, we hoped that we had found an efficient treatment for these terribly fatal brain and meningeal infections, but as a result of our own experiences, we are compelled to conclude that mercurochrome is of no value in the treatment of central nervous system infection. This opinion is concurred in by Dr. James B. Ayer of Boston, who is

an authority in American neurology. Notwithstanding our opinion, the reports of this treatment are so meager in the literature and it has apparently been used so little, that possibly there will yet be devised some means of using it with greater success.

BIBLIOGRAPHY

1. Visher, John W.: Northwest Medicine, June, 1924, 271.
2. Hopkins, F. S.: Boston Med. and Surg. Jour., Oct. 16, 1924, 732.
3. Visher, John W.: Jour. Am. Med. Assn., Aug. 2, 1924, 376.
4. Young, Hugh H., and Will, J. H.: Jour. Am. Med. Assn., March 1, 1924, 669.

"Since the first week in January he has supplied these stations with a weekly statement corresponding to barometric readings of the weather bureau, showing the number and location of all reported cases of contagious diseases in the cities concerned. With this information the local health officer can determine the probable danger to his community and take steps to ward off epidemics. 'Epidemics are no longer the mysterious outbursts of the past,' said Dr. Rawlings. 'On the contrary, the prevalence of the common contagions can be predicted with an accuracy that approaches weather forecasting. Just as tornadoes and cyclones are atmospheric disturbances peculiar to the warmer months, so epidemics of various diseases have a seasonable predilection, appearing with the greatest frequency during the colder months. As the path of a storm is indicated by fluctuations of the barometer, so the course of an epidemic is determined by the location of unquarantined cases and the number and activities of susceptibles. For these reasons the Illinois State Department of Public Health has determined to supply local health officers in the forty-four largest cities of the State with a weekly communication showing the reported prevalence of communicable diseases. On the basis of these reports the health officers can take precautionary measures against the introduction of contagion into the communities which they serve.'"—Isaac D. Rawlings, *Hygeia*.

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VOLVULUS OF THE SMALL INTESTINE*

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Volvulus, as defined by Van Hook and Kanavel,[5] is a rotation or twisting of a loop of bowel upon its mesenteric axis with resulting obstruction of the fecal current and blood supply. Rokitanasky,[5] according to the same authors, states that the entire mesentery, or a section of it, may rotate from one-half to several times upon its axis. Briggs[3] found that 15 per cent of acute obstructions were due to volvulus. The twisting may be partial, complete, or in two or three turns. Bickham[1] defines two types, namely, simple volvulus, where the loop of bowel is twisted on its mesenteric axis, and compound volvulus, where two loops are twisted about each other.

The ileum, because of its length and because it occupies the hypogastric, the right iliac, the umbilical and the pelvic regions in the abdomen, seems to be the portion of the small intestine more predisposed to volvulus.

Cicatricial contraction of the mesentery due to peritonitis or mesenteritis, organic stricture of the bowel, unusual length of bowel, bands of adhesions, chronic constipation, kinks, attachment of the intestine to inflamed organs, strangulations through openings, and large gallstones attempting to pass through the small intestines, are some of the etiological factors in volvulus. The experiments of Senn,[4] who rotated loops of bowel in animals and sutured them into position, showed the normal bowel with a normal mesentery was able to break its sutures and adhesions and right itself in time to prevent obstruction, but the intestine of unusual length, with a long or very narrow mesentery, became paralyzed, thus preventing its release and causing obstruction.

Rokitanasky[5] found volvulus occurring more frequently in men than in women. Very tall individuals with correspondingly long intestines are especially predisposed. Russian investigators[6] found that volvulus of the small intestine was the most frequent form encountered, due doubtless to the tall stature of the average Russian.

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*Read before the Hennepin County Medical Society, Minneapolis, October, 1925.

Bickham[1] discovered that volvulus of the small intestine in infants was usually due to narrowing of the mesentery.

The onset is usually sudden, accompanied by pain, vomiting and the absence of bowel movement. The fecal odor of the material vomited becomes more typical as the condition advances. The pulse, temperature and respiration may be unaffected at the beginning of this condition and may remain so until it is well established. The leukocyte count is not always of great value, as it may be high or it may be low.

An examination of the patient usually reveals a tense abdomen with loops of the distended bowel many times forming a palpable mass and visible peristalsis.

The diagnosis, as in all forms of intestinal obstruction, hinges on the absence of bowel movement and on the inability of enemas to produce results, as well as the typical odor of the vomitus. History of previous attacks of abdominal diseases, operations for their relief and chronic constipation are all of diagnostic value.

Once the diagnosis is established, the treatment is always surgical.

In operating. either a long rectus or a subumbilical incision may be used, depending somewhat upon the location of the trouble. The operation consists of locating and severing adhesive bands, untwisting the volvulus and an examination of the distended and collapsed portions of the intestine. Unless the situation appears quite favorable, it is well to drain a portion of the distended bowel by means of a rubber tube, fastening the bowel and tube to the peritoneal opening. Plicating the mesentery and stitching it to the parietal peritoneum are methods often employed to prevent the recurrence of volvulus. Resection of a gangrenous portion of the intestine and mesentery may also be imperative. but the majority of these patients are not in condition to undergo prolonged surgical procedures and the simple drainage with its resulting fistula is no doubt the means of saving life in many cases.

The prognosis depends upon the length of time since the obstruction took place, the resistance of the patient, duration of operation, and whether or not drainage is established in extremely distended cases.

In a series of twenty-nine cases at St. Thomas Hospital, London, quoted by Burghard and Kanavel,[2] there was a mortality of 65 per cent. The mortality in the hands of others varies from 50 to 65 per cent usually.

The accompanying illustrations of the five cases operated upon are somewhat schematically drawn from the operative findings of the surgical charts with the exception of Figure 5, which was demonstrated upon the cadaver for the artist.

The five cases here reported were all due to the ileum becoming adherent to some other structure. Three of the abdomens had been opened previously.



FIG. 1.—ILEUM ADHERENT TO GALL-BLADDER.

CASE 1. (Fig. 1)—Mrs. J. K., age 49, female, housewife, Jewish.

Date First Seen: August, 21, 1922.

Chief Complaint: Pain in upper abdomen, especially in gallbladder region and sharp griping pains in bowels. Unable to get bowels to move even with the aid of an enema. Patient had been vomiting greenish material for the past twenty-four hours.

Family History: Negative.

Past History: Health good until this illness except for a gastric disturbance evidently due to biliary tract disease.

Present Illness: For the past several days, patient had pain in right abdominal quadrant, slowly increasing in severity. No bowel movement for the past twenty-four hours and had been vomiting.

Physical Findings: The abdomen was distended and tender, especially in the gallbladder region. Rather an indefinite mass was palpable over the upper right abdominal quadrant. Temperature 100, pulse 80, respiration 20.

Laboratory Data: The urine was negative and the leukocyte count 13,300.

Course in Hospital Previous to Operation: The patient was given enemas with no results. The vomiting continued in large quantities with a typical odor and appearance.

Diagnosis: Cholecystitis with obstruction of the bowel.

Operation: Following the usual preparation, under local anesthesia, the abdomen was opened by means of a long right rectus incision.

Findings: Distended loops of ileum presented at incision. A loop of ileum was attached to the gangrenous fundus of the gallbladder and was twisted twice upon its mesenteric axis (Fig. 1). The gallbladder was greatly enlarged and filled with large and small stones. The operation was continued under gas oxygen and ether anesthesia.

Work Done: Detachment of ileum and gallbladder, untwisting of volvulus, opening of gallbladder through the gangrenous portion of the fundus, removal of the stones and drainage of gallbladder.

Course in Hospital Subsequently: There was considerable distention and some pain the first three days. The gallbladder drained well and there was no further intestinal trouble. Gas passed from the bowels in the usual manner.

Results: The patient left the hospital on September 12, 1922. The gallbladder drained for a reasonable length of time. A post-operative hernia developed, which was repaired by me on July 26, 1924.

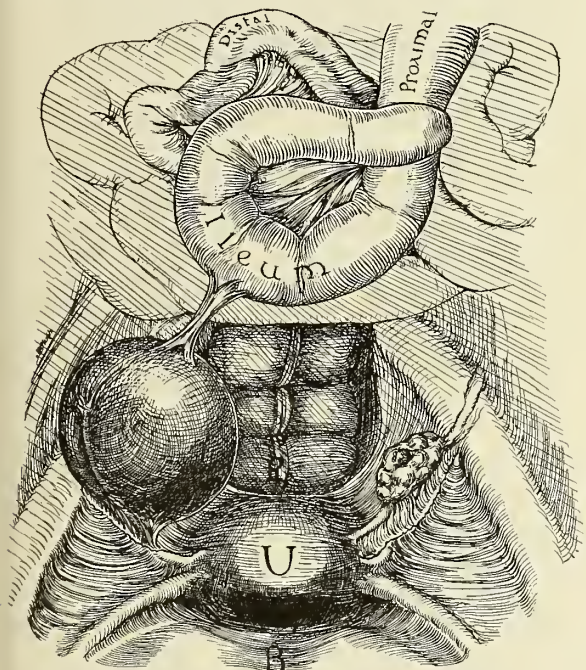


FIG. 2 - ILEUM ADHERENT TO OVARIAN CYST

CASE 2. (Fig. 2)—Mrs. Anna O., age 35, housewife, white, American.

Date First Seen: September 6, 1922.

Chief Complaint: Patient was suddenly seized with severe pain in the abdomen the day before, which confined itself to the epigastrium. The taking of foods or liquids produced vomiting. No bowel movement since the beginning of the attack.

Family History: Both tubes and the appendix had been removed in September, 1920. Since then she had been well until six months previous to this attack, at which time she became constipated, finding it necessary to use cathartics to obtain a bowel movement. Patient had also been belching considerable gas during the past six months.

Present Illness: Seized with pains on September 5, which persisted. Vomited on taking food and liquids; no bowel movement even with the aid of enemas and no gas passed from bowel.

Physical Findings: Patient fairly well developed, expression anxious, very restless, abdomen rigid and generally tender to the touch, especially over the lower right quadrant. There was a papable mass in this region.

Laboratory Data: The urine showed a faint trace of albumen, but was otherwise normal. Her hemoglobin was 83 per cent, red cells 4,800,000 and white cells 3,200.

Course in Hospital Previous to the Operation: She had continuous pain and vomited greenish foul-smelling fluid in large quantities.

Diagnosis: Obstruction of the bowels.

Operation: Following the usual preparation, the abdomen was opened by means of a long right rectus incision.

Findings: Considerable free fluid in the lower abdomen. A loop of the ileum near the ileocecal valve was attached to an ovarian cyst of the right side and twisted twice upon its mesenteric axis (Fig. 2). The left ovary was found to be cystic, also.

Work Done: The loop of ileum was detached: the volvulus untwisted and both ovarian cysts removed.

Course in Hospital: Recovery uneventful.

Pathological Report: Right and left ovaries showed cystic degeneration.

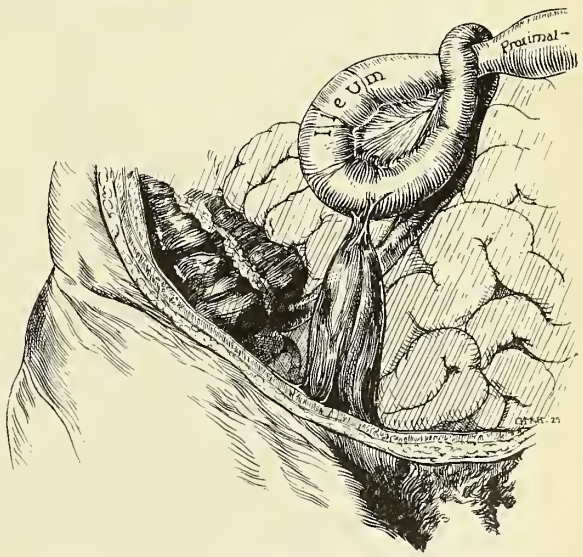


FIG. 3 - ILEUM ADHERENT TO SAC OF HERNIA

CASE 3. (Fig. 3) — George M., male, age 53, janitor, white, Dutch.

Date First Seen: August 10, 3 P. M.

Chief Complaint: Inability to get bowels to move even with the aid of salts and castor oil taken that morning. Paroxysms of severe pain in abdomen. (Advised of grav-

ity of condition and ordered to hospital but refused to go.)

Family History: Negative.

Past History: Patient had a right inguinal hernia of many years standing, and was chronically constipated.

Present Illness: Unable to get bowels to move for past two days. Severe cramps in abdomen. Salts and castor oil taken that morning only served to increase the abdominal pains. (Seen again that evening.) No enema had been given as instructed and patient had vomited considerable throughout the afternoon. (He then agreed to go to the hospital.)

Physical Findings: Patient very tall and muscular, with no excess of weight. Palpation of abdomen revealed nothing, but percussion elicited a very flat tone in lower abdomen to the right of the median line. (The abdomen became very tense during the examination. Patient drew his knees up to his chest to relieve pain.) Right inguinal hernia. Tenderness very marked at external ring.

Laboratory Data: Emergency case—no blood or urine examinations made.

Course in Hospital Previous to Operation: Patient was given an enema with no results. Vomited very large amounts of typical fecal matter. Temperature 98, pulse 78, respiration 20. Evidently in condition of shock due to prolonged suffering.

Diagnosis: Complete obstruction of bowel.

Operation: Following the usual preparation, the abdomen was opened by means of a long right rectus incision.

Findings: Greatly distended coils of the small intestine bulged out through the opening and a loop of the ileum was found to be attached to the pulled-out sac of a right inguinal hernia. This loop of ileum was twisted two and a half times upon its mesenteric axis (Fig. 3).

Work Done: The adhesion was quickly severed and the volvulus untwisted.

Course in Hospital Subsequently: Patient died an hour later.

Case 4. (Fig. 4)—Miss Lena A., age 27, female, milliner, Swedish.

Date First Seen: January 24, 1924.

Chief Complaint: For the past twenty-four hours patient had had pain in abdomen, absolute constipation and vomiting.

Past History: Hemorrhoidectomy three and a half years previous. Appendectomy, double salpingectomy and suspension of the uterus, a year previous to this attack, for the relief of appendicitis, salpingitis and retroflexion of the uterus—latter fixed and immovable by adhesions. Patient had always been constipated, having gone three and four days at a time without a bowel movement. This condition was relieved after the second operation, but the patient gradually became careless in her habits again with resulting habitual constipation.

Present Illness: Since January 23, patient had been suffering with pain in her abdomen and absolute constipation.

Physical Findings: Patient undersized and a very slender individual. Expression anxious, abdomen distended, tender and tympanitic. Knees drawn up to relieve pain. Temperature 98, pulse 100, weak, irregular and hard to count.

Laboratory Data: Urine normal. Hemoglobin 73 per cent, red cells 4,900,000, white cells 7,200.

Course in Hospital Previous to Operation: Patient continued to have pain, vomiting and absolute constipation. Molasses enema produced a liquid stool, but the vomiting

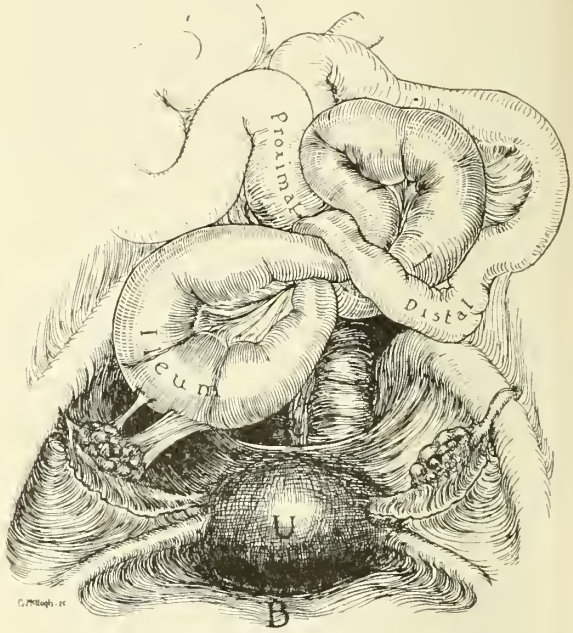


Fig. 4 – Ileum Adherent to Ovary

continued and was of a distinctly fecal odor and in large amounts. Repeated stomach lavages brought away very large amounts of greenish brown fluid with a fecal odor. Intravenous saline given. Later enemas unproductive.

Diagnosis: Obstruction of the bowel. Patient taken to the operating room early in the evening of January 25, 1924.

Operation: Following the usual preparation, the abdomen was opened by means of a long right rectus incision.

Findings: A loop of the ileum was attached to the right ovary and twisted twice upon its mesenteric axis (Fig. 4).

Work Done: The adhesions were separated, the volvulus untwisted and the small intestine drained by means of a long rubber tube through the peritoneal opening.

Course in Hospital Subsequently: Her recovery was uneventful. The fistula followed the usual course in closing, narrowing itself down eventually to a very small opening, and was closed operatively February 4, 1925.

Case 5. (Fig. 5)—Miss Elsie R., aged 30, housemaid, white, American.

Date First Seen: August 3, 1925.

Chief Complaint: Inability to get bowels to move, pain and vomiting.

Family History: Negative.

Past History: Operated upon November 20, 1922—double salpingectomy and appendectomy. Her recovery was uneventful and subsequent health fairly good up until about six months ago, since which time she had been constipated.

Present Illness: On Monday, August 3, a slight diarrhea appeared, following the eating of meat. The patient had a bowel movement from an enema given Monday, but no results from the one given Tuesday and vomited some greenish material with an odor suspicious of feces. She was seen again Wednesday evening for the second time and sent to the hospital.

Physical Findings: Patient very tall, slender woman, with a poorly developed chest and considerably underweight. An examination revealed rigidity of the abdominal muscles of both sides and on palpation marked tenderness over most of the abdomen. A palpable mass was present to the right of the median line, extending downward into the pelvis. During the examination, reverse peristaltic waves were visible on the abdomen attended by paroxysms of severe pain, followed by vomiting of large amounts of greenish brown fluid with a distinct fecal odor. Her temperature was 99, pulse 100, and respiration 25.

Laboratory Data: Leukocyte count 18,000. Urine negative.

Course in Hospital Previous to Operation: Patient continued to have severe pain, copious vomiting and no bowel movement whatever.



FIG. 5 – ILEUM ADHERENT TO UTERUS AND ADNEXAL AREA WITH TORSION OF MESENTERY

Diagnosis: Obstruction of the bowel.

Operation: Following the usual preparation, the patient was operated upon Wednesday night, August 5. The abdomen was opened by means of a long right rectus incision.

Findings: Greatly distended loops of small bowel bulged out through the opening; loops of ileum adherent by dense bands across the fundus of the uterus and site of removed fallopian tubes; entire mesentery proper was twisted upon itself in half turn; omentum adherent to ileum and anterior peritoneal surface; considerable free fluid in cavity (Fig. 5).

Work Done: Adhesions severed by sharp dissection; untwisting of mesentery; catheter placed in ileum and drainage established through peritoneal opening.

Course in Hospital Subsequently: Recovery uneventful. Fistula not closed as yet.

SUMMARY

1. Volvulus of the small intestine is a very frequent cause of obstruction.

2. The ileum is the portion of the small intestine most frequently involved.

3. Very tall, slender individuals and those who have been subjected to abdominal surgery are predisposed to volvulus.

4. Peritonealization of the operated areas, where it can be done successfully, no doubt lessens the frequency of volvulus.

5. The diagnosis is based practically upon the same symptoms as other forms of obstruction.

6. An enterostomy is a very important part of the surgical procedure, especially in extreme cases.

7. A fistula resulting from an enterostomy in the small intestine does not always require a resection for its closure. Merely dissecting out the sinus, tying it off close to the intestine and a purse string suture, will sometimess uffice.

BIBLIOGRAPHY

1. Bickham, W. S.: Operative Surgery, Philadelphia and London, Saunders, 1924, 4, 777.
2. Burghard, F. L., and Kanavel, Allen B.: Oxford Surgery, N. Y. Oxford University Press, 1919, 2, 820 to 822.
3. Da Costa, John C.: Modern Surgery, Philadelphia and London, Saunders, 965.
4. Senn, Nicholas: Surgical Clinics, Chicago, Meyer and Moncreiff, Philadelphia and London, Saunders, 1919, 3, 681-688.
5. W. Van Hook and Allan B. Kanavel: Keen's Surgery, Philadelphia and London, Saunders, 1908, 4, 666 to 667.
6. Scesk, Casop Lek: Internat. Med. and Surg. Survey, 61 and 62 Prague, Jan. 28, 1922.

SURGICAL TREATMENT IN DUODENAL ULCER*

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In the study of patients with duodenal ulcer two main groupings will become apparent: (1) those whose symptoms are of short duration and who appeal for aid early; (2) those whose histories give a prolonged succession of exacerbations and remissions.

Further observation reveals the information that the majority of medical controls and cures are found to be in the first group, namely, those whose symptoms are of but relatively short duration. This explanation is further strengthened if the etiology of duodenal ulcer is accepted as being of bacterial origin. Medical management of these early cases and with it a detection and removal of various foci of infection can be expected to accomplish a cure. However, in those patients whose histories show recurrences of digestive troubles extending over years, other factors are usually present, chief among which are concomitant lesions. In the cases with recent histories these infective foci, not necessarily further gross intra-abdominal conditions, may be eradicated. In this sense a chronic recurring duodenal ulcer can be viewed as a systemic disease with local manifestations, for coupled with the ulcer symptoms are often those of co-existing abdominal pathology. An instance of this is the marked frequency in ulcer patients of previous operations for appendiceal disease, many being of the suppurative type. On close questioning their histories will usually disclose that there was but temporary relief, if any, with an eventful rearrangement of symptoms gradually assuming those of the ulcer complex. In these cases in which chronicity is the outstanding feature more permanent tissue damage has occurred with resultant formation of additional foci of infection so that these people present a broader and less definite medical approach with correspondingly less favorable prognosis.

Obviously, the patients classed as surgical will consist of those who, after fair time and trial, have found medical management wanting.

On further investigation those patients referred to as surgical will be found to lend themselves to further grouping both as to signs and symptoms as:

1. Those suffering from obstruction to the food current, due to stenosis, cicatrices, etc.
2. Those with repeated or gross hemorrhage.
3. Those with associated or co-existing pathology.
4. Those in whom medical control has been incomplete for various reasons.
5. Those with or attempting perforation.
6. Those in whom a question of malignancy enters into consideration.

The surgery necessary to overcome these conditions may not only be called upon to treat the ulcer itself, but to maintain or reestablish passage of the food current and in addition the proper disposition of other presenting lesions.

While duodenal ulcer has been recognized as a clinical entity since 1817 when Travers[1] reported three cases of perforation it was not until 1896 that Dunn[2] successfully treated duodenal ulcer by surgery. From then on great impetus was given the diagnostic as well as surgical treatment by Weir.[3] To Moynihan,[4] especially, goes the credit for arousing interest as to the frequency of duodenal ulcer. The diagnosis, treatment (medical and surgical) of duodenal ulcer, therefore, is of recent years, barely three decades.

As to the diagnosis, the ability to ascertain the presence or absence of the ulcer has been greatly augmented in recent years by various clinical tests, chief among which, excluding the history, is the roentgen study. This has resulted in definite localization of the lesion, thereby clarifying the condition previously labelled peptic ulcer, separating gastric and duodenal ulcers according to their respective locations.

Of all operative procedures advocated for the relief of duodenal ulcer, gastroenterostomy or gastrojejunostomy has received the greatest acceptance and has accordingly received the greatest praise as well as condemnation and both deservedly.

Following the original surgical studies in gastric and duodenal surgery during the late eighties and nineties by such men as Pean, Rydgier, Billroth, Wolffer, Van Hacker and others, a new era in upper abdominal surgery was ushered in. The surgical world at large was quick to avail itself of anything tending to offer relief to sufferers of upper abdominal disease, with the result that gastric and duodenal surgery, which was at first vaunted as a panacea, was instead soon found not only inadequate but dangerous, especially as gastrojejunostomy was all too often the sole method of attack irrespective of the type or location of the lesion.

*Read before the Hennepin County Medical Society, Minneapolis, Nov. 4, 1925.

As a consequence of this setback the operative results varied according to the accuracy of diagnosis and to each individual's surgical ability.

Upon closer study and analysis of the surgical successes and failures it was found that while there were great contrasts as to after-results, certain definite preoperative deductions could be reached depending upon the data obtained in an individual case and that among the predominating factors to be dealt with were:

1. Presence of a lesion. It is unnecessary to add that the best of surgery in the absence of an ulcer can but court disaster and yet this was one of the great stumbling-blocks especially before the universal acceptance of a definite history further substantiated by clinical and *x*-ray findings as the only leads to the diagnosis of duodenal ulcer.

2. That the surgical management of gastric ulcer was not identical with that of ulcers of the duodenum.

3. That recognition and proper disposition must be made of associated lesions.

4. That the ulcers of the duodenum also varied as to their predominating signs and symptoms and that these in themselves demanded recognition and proper care. This is especially true of ulcers with histories of repeated hemorrhage.

It is not surprising that surgery has been questioned, for, in spite of the preoperative diagnosis being confirmed at operation, there were still obstacles in many instances preventing a cure, namely: (1) continued activation of the ulcer; (2) co-existing and untreated lesions; (3) stomal ulcer (gastrojejunal ulcer); (4) faulty technic.

The problem of continued activation of the ulcer following operation but further emphasizes the necessity of recognition of coexisting pathologic processes. This factor of continued activation of the ulcer has to a large degree been overcome by the destruction of the ulcer bed itself, when possible, at the time of operation either by cautery or excision. The formation of gastrojejunal or stomal ulcer occurs as a complication approximately in 2 per cent of cases and is but further evidence of some causative agent, a form of infection, still undetected.

Much has been said and written relative to the technic of all gastrojejunal shuntings and anastamoses. Probably the one greatest factor of benefit was introduced in Czerny's clinic by Peterson[5] in 1901 when he abolished the long proximal loop and in addition advocated that, in making the union of the jejunum to the posterior gastric wall, the long axis of the stoma be parallel with the long axis of the stomach and at nearly right angles to the greater curvature.

The stand taken that gastroenterostomy is nonphysiologic is to a degree correct yet sufficient numbers of previous sufferers so treated bear undeniable proof of its efficacy. The attempt to routinely replace gastrojejunostomy by various plastic procedures on pylorus and duodenum has not been wholly successful, the objection to these plastic operations for relief of duodenal ulcer being that they are limited in their scope of application. That is, the more pronounced the lesion often the less chance of doing a plastic operation because of tumefaction or inflammation of tissues, location, size of lesion, and adjacent disease. In other words, when most needed, these plastic procedures often cannot, or at least with great difficulty and increased hazard, be applied. Again the postoperative healing of these pyloroduodenoplasties is not wholly without mishap for, though closed transversely to the long axis of the lumen, contraction scars with resulting obstruction are possible.

To counteract this phenomenon of constriction, Strauss[6] maintains that the sphincteric portion of the ring is also involved in this complication. He has therefore advocated the partial resection of the sphincteric body. Also there is a possibility of the suture line adhering to the abdominal wall, liver or colon, and thereby interfering with motility and mobility.

However, in spite of the disadvantages mentioned pyloroduodenoplasties have their field of usefulness, especially among the early type of patients in whom chronic long-standing changes have not as yet occurred.

As patients with duodenal ulcer are seen and recognized earlier the utility of pyloroduodenoplasties may become enhanced. At least they commend themselves from the anatomic and physiologic viewpoints.

Observations on patients with duodenal ulcer who have tried systematic competent medical management and who have not received the desired results and who have subsequently submitted to operative intervention should after all be the determining factors as to the merits of any procedure. Within the past several years numerous continental surgeons have advised and are doing more extensive procedures in duodenal ulcer, advocating various resections, their reasons being that the ulcer-bearing area which may have a predisposing tendency for reformation of ulcer is, by resection,

removed. While these more drastic methods are apparently gaining ground and with good statistical proof, yet insufficient clinical observation has elapsed to warrant the discontinuance of so valuable an aid as gastrojejunostomy.

There are numerous statistical studies showing proof of the contention that in properly selected cases of duodenal ulcer gastrojejunostomy preferably with destruction of the ulcer area offers all that can be expected of any surgical procedure.

Sir Berkely Moynihan[7] has stated before his clinic at the Leeds Infirmary that over 90 per cent of duodenal ulcer cases treated by gastrojejunostomy consider themselves perfectly well.

The mortality from the immediate effects of surgery plus later complications as jejuneal ulcer, etc., is approximately 3 per cent, which is considerably below the rate for those so afflicted but under medical supervision in whom Deaver[8] states there is a potential mortality of from 15 to 20 per cent from acute complications such as hemorrhage and perforation.

That sufferers of duodenal ulcer in whom gastrojejunostomy is indicated can look forward to a postoperative life expectancy up to that of the average person for corresponding sex and age is shown by a report from the Actuarial Society of America.[9]

In a patient with duodenal ulcer in whom medical management has failed, the surgical procedure necessary to shortcircuit his food current and to eradicate the ulcer bearing area, if advisable, is but a step further in his care. In view of our present knowledge of infection no patient should be allowed to go on his way simply because a new food channel has been constructed, but an intensive co-operative investigation should be instituted to determine and eradicate the underlying causes.

To quote Moynihan,[10] "The operation of gastrojejunostomy has been greatly discredited in consequence of its performance in grossly unsuited conditions. Its very success has been against it."

BIBLIOGRAPHY

1. Travers: Bass History of Medicine.
2. Dunn: Tr. Clin. Soc., London, 1894, 28, 204-212.
3. Weir: Med. News, New York, 1896, 419.
4. Moynihan: Brit. Med. Jour., 1903.
5. Peterson: Verhandl. d. deutsch. Gesellsch. f. Chir., Berlin, 1900, 29, Part 2, 620 to 640.
6. Strauss: Jour. Am. Med. Assn., 82, 1765-1770.
7. Moynihan: Lectures, 1923.
8. Deaver: Surgery of the Upper Abdomen, 8th edition.
9. Balfour: Quoted Jour. Am. Med. Assn., Aug. 6, 1924, 83, 603.
10. Moynihan: Lancet, 1923, 631.

THE DIAGNOSIS AND MEDICAL MANAGEMENT OF DUODENAL ULCER*

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Epigastric or abdominal distress, "indigestion" or "stomach trouble," as the patient calls it, may be due to such a great variety of intra- and extra-abdominal disorders that before one can make a diagnosis of duodenal ulcer the first essential is a careful history.

In analyzing 1,000 consecutive cases of indigestion, Willson[1] found that duodenal ulcer occurred in only 115 cases. The number of diagnoses in the 1,000 cases complaining of indigestion was ninety-eight. In fact, almost any disorder that human flesh is heir to may cause abdominal or epigastric distress or pain. Most of the other ninety-seven causes of indigestion could be eliminated by a careful history.

Although history taking may seem trivial and easy, often much time and patience are necessary to bring out the essential facts.

It is important to inquire into the family history especially in regard to mental instability, tuberculosis and lues. Personal history should begin with childhood. Repeated attacks of tonsillitis or rheumatism may have preceded stomach trouble due to heart disease. Or a history of jaundice may explain the present symptoms arising from the gallbladder. Often the patient has had indigestion for many years.

The gastrointestinal history should be complete. The chief complaint, its duration, onset and course should be noted. It is usually best to let the patient tell his story. This must be supplemented by questions in regard to appetite, deglutition, pain, belching, regurgitation, quality or quantity food dyspepsia, nausea, vomiting, weight loss, jaundice, night attacks, nature of stools, dyspnea, edema and urinary symptoms.

In regard to pain, inquiry should be made first as to its character. Is it a distress, a burning, grinding and gnawing sensation? Is it dull or sharp and agonizing? The time of its appearance, radiation, relation to food and mode of relief, if any, should be ascertained. If the pain occurs in attacks

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one must eliminate angina pectoris, renal colic and gallstone colic.

If there is vomiting the nature of the vomitus as to digestion of food and the presence of blood should be noted. Presence of food eaten some time before indicates retention.

Commonly one hears duodenal ulcer discussed as peptic ulcer, no attempt being made to differentiate between gastric or duodenal ulcer. As a matter of fact, it is very important to be specific because of the difference in symptomatology, prognosis and treatment. Duodenal ulcer is much more common than gastric ulcer. In the 1,000 cases complaining of abdominal symptoms above mentioned gastric ulcer occurred twenty-one times, while duodenal ulcer occurred 115 times.

Both types of ulcer may be acute or chronic. The duration of symptoms may be from a few months to ten or twenty years.

The patient with duodenal ulcer complains of epigastric distress, burning or gnawing in character, coming on in spells usually in the spring and fall of the year, lasting from a few weeks to a few months and with alternating periods of remission and exacerbation. At first the spells are infrequent and of short duration. Later they are more frequent, longer in duration and less easily controlled by the patient. The pain or distress is relieved by food and alkalies. It recurs from one-half to three hours after eating, depending to some extent on the quantity and quality of the food eaten.

The order of events is food, relief, pain; food, etc. Unless there is a variation in the amount of food taken at a meal the pain occurs at the same hours each day. Night distress, occurring usually at midnight, is common. The patient soon learns to relieve this by taking a glass of milk or some soda. As the ulcer becomes chronic the pain becomes more continuous.

If the ulcer is on the posterior wall of the duodenum or has perforated to the head of the pancreas there may be radiation to the back.

Vomiting is rare unless marked obstruction is present. Hematemesis and malena may occur. According to Horgan,[2] it occurs in 20 per cent of the cases of duodenal ulcer. In our experience it does not occur that often.

Patients with duodenal ulcer are nearly always well nourished and active. They have a good appetite and all they seek relief from, prior to obstruction, is indigestion and pain. As the ulcer becomes chronic or if there is marked obstruction weight loss is more in evidence.

Physical examination reveals no distinguishing evidence of duodenal ulcer. There is usually some tenderness in the mid-epigastrium slightly to the right. The chief value in physical examination lies in the exclusion of other conditions. Cardiovascular disease or even pulmonary tuberculosis may cause epigastric pain. The symptoms of cholecystitis may simulate duodenal ulcer. If one finds definite right costal margin tenderness or perhaps a palpable gallbladder a diagnosis of cholecystitis is evident. The abdomen should be carefully examined by inspection, palpation and percussion. Rectal examination should be a routine procedure.

Fractional gastric analysis may show the presence of hyperacidity, but often the curve is entirely normal.

Examination of the feces after three days of hemoglobin-free diet may or may not show occult blood. Absence of blood does not exclude ulcer.

Roentgenologic examination is very important. A duodenal cap which presents evidence of deformity or irregularity, associated usually with tenderness, in conjunction with a satisfactory history of duodenal ulcer is most significant. It should not be overlooked, however, that an ulcer may be present in the absence of positive *x*-ray findings.

The history in gastric ulcer is usually different. The patient is older and often undernourished or even cachectic and anemic. Food relief is not always definite and the patient often vomits to obtain relief. The pain always subsides before the next meal, while in duodenal ulcer it persists until food is taken. Periodicity is absent or less marked than in duodenal ulcer. There is less desire for food and often the patient is afraid to eat.

The location of the pain is epigastric, but often to the left of the mid-line, and point tenderness is common. Hemorrhage, when it does occur, is more severe than in duodenal ulcer.

Roentgenologically, gastric ulcer is demonstrated more easily than duodenal ulcer. A so-called niche or crater is found usually on the lesser curvatures. Often there is an incisura on the greater curvature due to spasm of the circular muscles.

The prognosis in gastric ulcer is not as good as in duodenal. The possibility of malignancy is

very great. Cancerous changes have been found[3] in 71 per cent. Any ulcer exceeding 25 mm. in diameter may be expected to be malignant. Malignancy rarely occurs on the duodenal side of the pyloric sphincter while cancer cells can frequently be found in the margins of an excised gastric ulcer.

In treating duodenal ulcer it is customary with us to place all patients on ambulatory dietary management except in cases of marked obstruction, or recent or repeated hemorrhages. If the obstruction is slight, frequent feedings and alkalies may bring relief. When more severe, rest in bed and peristaltic paralyzants together with dietary management are instituted. It is obvious that patients with recent hemorrhage should be put to bed. All are asked to be as quiet as possible during the first few weeks.

Our experience has been that most cases of non-obstructive duodenal ulcer obtain relief of symptoms, usually within twenty-four hours, on a two-hour management. Four to six ounces of milk and cream are given every two hours from 7 A. M. to 9 P. M. Midway between feedings 2 grams of an alkaline powder containing enough magnesium oxide to insure a daily evacuation of the bowel is given.

Beginning with the second or third day the patient is allowed, at four-hour intervals, in addition to the milk and cream, one ordinary cupful of a prescribed list of foods. The usual list from which he may select as he desires includes farina, cream of wheat, custard, tapioca, cornstarch or bread pudding, cream soups, soft eggs, etc. This list is gradually added to until it includes mashed vegetables, cooked fruits and finally beef, lamb, fish and chicken. The quantity is also gradually increased. The patient is weighed at each visit to the office.

All food should be mechanically non-irritating, it should not increase the hydrochloric acid content of the gastric juice, it should be small in volume and yet have sufficient caloric value to maintain weight.

During the first week there is usually a slight loss in weight, but after that the patient either holds his own or gains.

During the first three weeks the patient should report at least twice a week.

If the patient is symptom-free after seven or eight weeks of frequent feedings he is placed on a three-meal selected diet with a light lunch between meals. The milk and cream is continued at meals and between meals. Alkali is given one hour after the larger meals. He follows this plan for at least a year or two. As a matter of fact he should remain under observation indefinitely and his diet may have to be restricted as long as he lives.

Naturally, it is important to remove any and all possible foci of infection whether these be in the teeth, sinuses, tonsils, prostate, cervix, gallbladder or appendix.

Patients who do not respond to careful dietary management should be treated surgically. Obviously, surgical intervention is indicated in obstruction or when repeated hemorrhages have occurred.

On account of the frequent occurrence of malignancy in gastric ulcer I believe that this condition should be treated surgically unless the ulcer is small, non-penetrating and acute.

To summarize: The essentials in arriving at a diagnosis of duodenal ulcer are:

1. A careful history.
2. General physical examination.
3. Gastric analysis and general laboratory examination.
4. Roentgenologic examination.

It is important that one differentiate clearly between gastric and duodenal ulcer mainly, because of the frequency of malignancy in gastric ulcer.

Ambulatory management in most cases of duodenal ulcer is not only an economic necessity, but has been very satisfactory in the absence of marked obstruction, repeated hemorrhages and concomitant organic lesions.

BIBLIOGRAPHY

1. Willson, H. S.: A study of one thousand consecutive cases presenting gastrointestinal symptoms.
2. Horgan, E.: The more common forms of dyspepsia requiring surgical treatment.
3. Wilson, L. B., and Willis, B. C.: Pathological relationship of ulcer and carcinoma.

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EDITORIAL

The May Meeting

The time of our annual meeting is at hand. During the last month, the American Medical Association met in Dallas; doubtless, many of you were in attendance and unquestionably you all felt well repaid. In the coming month, the State Association meets in its annual conference, to review the work of the past year and to lay plans for the future. Many members question the value of these meetings, their purposes and their benefits. They feel that a few run the affairs of the Society and put their friends on the program, thus making it a closed corporation. This is a grave misconception which rests on unfamiliarity with the aims of the Association and with non-participation in the deliberation on the part of many doctors who are members in name only. To thoroughly understand the problem, it is necessary to discuss it in such a way that everyone will see it from the proper viewpoint.

Medical meetings are held for three purposes:

1. To direct the policies of physicians as an organization in their relation to the public.

2. The interchange of personal opinion, experience and ideas for mutual benefit.

3. To provide recreation and promote a better fellowship in the profession such as comes through personal acquaintance.

Since time immemorial, people interested in like things have banded together for protection of common interests. The members of the medical profession recognized this principle very early, for they knew that in union there was strength. We are all by nature more or less selfish; physicians are proud of their profession, their membership and its conduct. At first, when the societies were small, rules of conduct and policy could be formulated and acted upon by the membership as a whole, but as the associations grew, this part of the work had to be turned over to delegates, who make up the House of Delegates. These representative individuals are responsible for the government. It is their duty to elect officers and to look after the rights of physicians as a whole, to protect them from imposition on the part of irregular cults and to protect the public by acting as advisers on matters of public health. The officers report upon their activities to their constituents and are really the organized force. If a member feels that he is not represented, it is because he does not take part in the deliberations of the constituent county societies, who elect the membership to the House of Delegates. Active participation at home will obviate this feeling.

The second purpose is purely professional. The majority of physicians are interested in this phase, being content to allow the more aggressive and better qualified men to look after the governing end. Richard Cabot once said in a lecture that doctors of medicine should, like their commercial brothers, take an annual inventory of their work. This should not be limited to the financial side alone, but it should include the professional as well. Each year

every practitioner, whether he work in the remotest hamlet or in the most distinguished clinic, has the opportunity of observing certain phenomena of disease which are of particular interest from diagnostic, therapeutic or prognostic viewpoints. The results of these observations should be given over to the profession at large. Our meetings are so constituted that any member who has anything of interest to present may do so in a paper. To those men who feel that they are unable to present their views in writing, the discussions are open for the interchange of opinion. There is no phase of a medical meeting which brings out personal experience and observation and which makes such a lasting impression, as a spirited open debate. The tendency to make papers largely a review of the literature and quotation of statistics is deplorable. Medical literature is crammed full of such material which can be used to prove anything one wishes. A discussion on the other hand is largely personal and much more instructive.

Last, but not least, one must not overlook the recreational features. All work and no play makes Jack a dull boy. Doctors should never be too old to play. Good entertainment in the evening and such wholesome sport as golf are essential. A meeting devoted to scientific deliberations only is very fatiguing. What can be better to break down reserve and formality and to promulgate intimate acquaintance than active participation in sport. Here the pressing professional worries are forgotten and good fellowship displaces the petty jealousies of everyday competition.

If you keep these things in mind, it is obvious that you should attend the coming meeting. The chairmen of your various committees have worked hard and will have many interesting reports to make. The program committee has arranged an excellent scientific presentation and you may rest assured that the recreational features will come up to the traditional St. Paul excellence. No one is so big professionally that he will not profit by his attendance, nor is anyone so small that his opinion is not worth while. The success of the meeting is up to you and the personal interest you take in its deliberations. You will be the gainer, your patients will be benefited and the community from which you come will realize that they have in their midst a real progressive physician.

O. N. M.

The Medical Profession of Minnesota and the Sheppard-Towner Act

On April 20, 1921, the State Legislature of Minnesota authorized the State Board of Health to provide instruction and advice to expectant mothers, and also accepted the provisions of any Federal Act for promoting the hygiene of maternity and infancy. On November 23, 1921, Congress passed "An Act for the promotion of the welfare and hygiene of maternity and infancy, and for other purposes." January 10, 1922, the State Board of Health created a Division of Child Hygiene, approved the program outlined by its executive officer, and appointed the State Advisory Board on Maternal and Infant Hygiene. The recommendation for the formation of County Administrative Boards was also approved. The Federal funds became available to the State on March 28, 1922. On April 21, 1922, the State Advisory Board, which numbers among its members two practicing physicians, one pediatrician, and one obstetrician, suggested the formation of County Administrative Boards consisting of two physicians, one county commissioner, and two women. On May 10, 1922, the question of the formation of County Administrative Boards was taken up with the Secretary of the State Medical Association. The next day a letter was sent to the President of the State Medical Society regarding the County Administrative Boards. On June 16, 1922, a letter was also sent to the President of the State Medical Association relative to this matter. On this same date, Dr. E. C. Hartley was appointed Director of the Child Hygiene Division, which was organized on July 1, 1922. In August of that year, Dr. E. C. Hartley published an editorial in Minnesota Medicine entitled, "The New Child Hygiene Division—Its Relation to the Physicians of Minnesota." In this article the program of the Division was outlined. On September 23, 1922, a letter was sent to each county health officer and to the officers of the State and each District and County Medical Society relative to the plan of work, with the request that a physician be selected in each county to act on the County Administrative Board. On October 12, 1922, a letter was received from the President of the Minnesota State Medical Society recommending two physicians from each county to serve on these Administrative Boards. These recommendations were approved by the State Board of Health at a meeting held on October 25, 1922. On October 14, 1922, at the Annual Meeting of the House of Dele-

gates, a resolution, to indorse the action of the American Medical Association in condemning the Sheppard-Towner Act, was laid on the table, where it still lies. The Minnesota State Medical Association has apparently refused to support the American Medical Association in its action relative to the Sheppard-Towner Act.

The Medical Society of this State has co-operated in carrying out the provision of this Act since the work was begun in Minnesota. So far as the Maternal Hygiene is concerned, the formula has been very simple, namely, to educate the laity to seek professional advice from physicians wherever and whenever possible during pregnancy, labor, and the puerperium. This, of course, presupposes that the physicians are willing and ready to give this care to their patients. The author has been interested mainly in this phase of the work, and owing to some criticisms and actions has been impelled to write this statement of facts for the enlightenment of the medical men of this state. It is important in matters of this kind to have accurate information before opinions are formed, and decisive action taken. The work is still being carried on according to the original plan of co-operation with the medical profession of this state.

FRED L. ADAIR, M.D.

Annual Meeting

Spring was a long time in making its appearance this year. The usual monotony of winter practice was prolonged and emphasized by an epidemic. Anything like a vacation belonged to the realm of dreams. But a ray of hope was vouchsafed to us by the State Medical Society. MINNESOTA MEDICINE announced the State Medical Meeting, St. Paul, May 17-19.

You may leave your grind of work; in fact, it is quite possible your community is enlightened enough to expect you to do so.

Whether many of the items on the program appeal to you or not, there is no getting away from the fact that no one returns from a State Meeting without benefit. He has picked out at least some things he wanted to see or hear, he has seen some of his friends and somehow or other he feels a distinct stepping-up of his ability to tackle the next problems, whatever they may be.

One conceives an admiration for that program committee that started the 15-minute paper — a stroke of diplomacy! No longer do they have to beg of the eminent and perhaps temperamental specialist not to indulge his propensity for historical, pathological, theoretical or reminiscential details. They say: You have fifteen minutes to set forth what you know on the subject you select. And how it has worked! Every meeting that adopts that plan is well worth attending.

H. B. A.

Copenhagen Snuff

It is no unusual experience for physicians in this part of the country to encounter patients complaining of symptoms obviously the result of the snuff habit. Although snuff was fashionable a century ago, when the gentleman carried his snuff box and occasionally indulged in a sneeze, the present habit is quite different. Now the usual procedure among snuff users is to take a good-sized pinch of a finely cut tobacco known as Copenhagen snuff (made in Chicago) and place it under the lip or between the gum and cheek. The Copenhagen habit is apparently widespread in Minnesota and some neighboring states. Scandinavians, Danes and Finlanders are said to be particularly addicted, probably having been attracted in some instances by the name.

As pointed out several years ago by Hierscher,* users generally present rather characteristic symptoms. The pulse is usually elevated to a rate of 80 or 90 and the blood pressure may be moderately raised. While the heart is not increased in size, the heart tones usually sound harsh and rough, and a murmur may be elicited on exertion. Shortness of breath, palpitation and heart pain are the complaint. The writer has seen at least one instance of albuminuria which disappeared on discontinuing the use of snuff.

It has been frequently observed that habitual users—and the habit becomes very difficult to break—show an obtunding of intellect and moral sense. Users describe sensations similar to those produced by an alcoholic drink. The need for increasing amounts of snuff leads to the consumption in some instances of large quantities. The effect of this excessive use is so similar to that of narcotic drugs

*St. Paul Med. Jour., 1915, 17, 183.

that the suspicion of cocain or other narcotic content has frequently been voiced.

Unfortunately, no extensive analysis, so far as we have been able to learn, has ever been made to determine the constituents of Copenhagen snuff. Dr. E. D. Brown of the Department of Pharmacology of the University of Minnesota, a few years ago, made determinations of the nicotin content of Copenhagen snuff, but failed to find any other alkaloids present. His attention had been called to the presence of a partial anesthesia as well as a thickening of the lips among users in the employ of the Twin City street railways, and evidence of the presence of cocain particularly was sought.

If tobacco is the main constituent of Copenhagen snuff, it is difficult to explain why chewers of ordinary cut plug do not manifest similar symptoms. Probably, as Dr. Brown suggests, the comminution of the tobacco in snuff form permits greater absorption of the nicotin content both by way of the mucous membrane of the mouth and through swallowing. Nicotin, being volatile, is known to be readily absorbable through the mucous membrane and even through the intact skin. A well known stunt in army circles has been to place a large quid of tobacco in the arm-pit in order to obtain the toxic gastro-intestinal effects in feigning illness.

When we consider that the alkaloid, nicotin, is a volatile liquid, and that, according to Sollmann, approximately one grain is fatal to man and that an ordinary cigar may contain twice the fatal dose, it seems rather strange that the smoking of tobacco does not produce more serious effects. Tobacco varies in its nicotin content, that grown in Havana and Maryland, according to the same author, containing 1.5 to 3 per cent, while that from Virginia and Kentucky runs as high as 6 to 8 per cent. Some of the nicotin content is lost, it is true, in the curing of the tobacco leaf and the drier the tobacco the more nicotin is destroyed when smoked. Some of the symptoms produced by the use of tobacco in any form are undoubtedly due to the nicotin effect. The preliminary stimulation and later manifestations of depression of the central nervous system are the experimental findings with pure nicotin. The symptoms, too, in snuff users tally very closely with the effects produced by large doses of pure nicotin experimentally.

In 1913, North Dakota legislated against the use of snuff or its substitutes in any form. So-called Right-Cut chewing tobacco was declared to be essentially snuff. The use of common chewing tobacco was excepted. An illicit traffic in snuff made its appearance. The snuff was shipped into the state to individuals who guaranteed to deliver and collect for the contraband.

The question arises, of course, whether it is worth while to legislate against substances known to be injurious. General education as to the facts is of value.

The sum total of the experience of Minnesota physicians would furnish convincing proof of the insidious and deleterious effects of snuff used as chewing tobacco.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA STATE MEDICAL ASSOCIATION

The fifty-eighth annual session of the Minnesota State Medical Association will be held at the Masonic Temple, St. Paul, May 17 to 19, 1926. All meetings will be held in the Masonic Temple (corner Sixth Street and Smith Avenue), unless otherwise specified. The day following, May 20, will be devoted to clinics at the various hospitals in St. Paul under the auspices of the Clinical Section of the Ramsey County Medical Society. This will take the place of the usual St. Paul Clinic Week. Hotel headquarters will be at the Saint Paul Hotel.

OFFICERS

H. M. Johnson, M.D., *President*.....Dawson
W. F. Braasch, M.D., *1st Vice Pres*.....Rochester
A. N. Collins, M.D., *2nd Vice Pres*.....Duluth
E. G. McKeown, M.D., *3rd Vice Pres*.....Pipestone
E. A. Meyerding, M.D., *Secretary*.....St. Paul
Earle R. Hare, M.D., *Treasurer*.....Minneapolis

COUNCILORS

FIRST DISTRICT
W. F. Braasch, M.D. (1927).....Rochester
SECOND DISTRICT
L. Sogge, M.D. (Appointed to fill vacancy).....Windom
THIRD DISTRICT
H. M. Workman, M.D. (1929).....Tracy
FOURTH DISTRICT
F. A. Dodge, M.D. (1928).....LeSueur
FIFTH DISTRICT
F. J. Savage, M.D. (1929).....St. Paul
SIXTH DISTRICT
W. H. Condit, M.D. (1928).....Minneapolis
SEVENTH DISTRICT
J. G. Millspaugh, M.D. (1929).....Little Falls
EIGHTH DISTRICT
G. S. Wattam, M.D. (1928).....Warren
NINTH DISTRICT
W. A. Coventry, M.D. (Appointed to fill vacancy).Duluth

The Council will meet at the office of the State Association, 11 West Summit Avenue, at 10 A. M., Monday, May 17, 1926.

The House of Deelgates will convene at 2 P. M., Monday, May 17, in the Blue Room of the Masonic Temple. The second meeting for election of officers will be held at luncheon, Tuesday noon.

The Medical Economics meeting, our secretary, Dr. E. A. Meyerding, presiding, will be held in the auditorium of the Masonic Temple, May 17, at 8 P. M. The following program will be presented:

THE MEDICAL PROFESSION AND THE PRESS
Mr. Herbert R. Galt.....St. Paul
Managing Editor Dispatch and Pioneer Press

DEGENERATE DISEASES AND PERIODIC HEALTH EXAMINATIONS
Chas. P. Emerson.....Indianapolis
Dean Indiana University School of Medicine

THE WOMEN'S AUXILIARY
Mrs. J. T. Christison.....St. Paul
President of the Women's Auxiliary

FADS AND QUACKS
Morris Fishbein, M.D.....Chicago
Editor, American Medical Association Journal

PROBLEMS OF THE STATE MEDICAL ASSOCIATION
H. M. Johnson, M.D.....Dawson
President, Minnesota State Medical Association
C. B. Wright, M.D.....Minneapolis

The Medical and Surgical Sections will meet jointly throughout. The following program interspersed with clinical and pathological demonstrations will be offered:

TUESDAY MORNING — MAY 18
8:30 o'Clock

Auditorium, Masonic Temple

JOINT MEETING—MEDICAL AND SURGICAL SECTIONS

Theodor Bratrud, M.D., and C. B. Wright, M.D., Chairmen

MODERN METHODS OF TESTING THE ACUITY OF HEARING; DEMONSTRATION OF SEVERAL TYPES OF AUDIOMETERS.
Horace Newhart, M.D.....Minneapolis

CANCER OF THE LARYNX
Gordon B. New, M.D.....Rochester

ACUTE LARYNGEAL OBSTRUCTION
G. W. Adler, M.D.....Winona

SURGICAL TREATMENT OF PANCREATITIS
B. F. Davis, M.D.....Duluth

SYMPOSIUM ON INFANTILE PARALYSIS
ITS MECHANICAL TREATMENT
C. C. Chatterton, M.D.....St. Paul
ITS SURGICAL TREATMENT
M. S. Henderson, M.D.....Rochester
CORRELATION OF PATHOLOGIC AND CLINICAL PICTURES
J. C. McKinley, M.D.....Minneapolis
ITS BACTERIOLOGIC ASPECTS
E. C. Rosenow, M.D.....Rochester

CHOREA GRAVIDARUM—NEUROLOGICAL ASPECT
Frank Whitemore, M.D.....St. Paul

RECENT PROGRESS OF PSYCHIATRY
G. N. Ruhberg, M.D.....St. Paul

PSYCHOPATHIC HOSPITAL
S. T. Orton, M.D.....Iowa City, Ia.
Prof. Psychiatry, State Univ. of Iowa

AMNESIA, A CLINICAL STUDY
E. M. Hammes, M.D.....St. Paul

URETERAL STRICTURES
EDWARD BRATRUD, M.D.....Warren

TUESDAY AFTERNOON — MAY 18
1 o'Clock

MOVING PICTURES OF HUMAN INTESTINAL PROTOZOA
T. B. Magath, M.D.....Rochester

PERICARDITIS
Frank Spicer, M.D.....Duluth

SYMPOSIUM ON CARDIOVASCULAR RENAL DISEASE, WITH PRESENTATION OF CASES
Hilding Berglund, M.D., Professor of Medicine, University of Minnesota, Minneapolis, and
L. G. Rowntree, M.D.....Rochester
DISCUSSION WITH RELATION TO ARTERIAL HYPERTENSION
C. P. Emerson, M.D., Dean of Indiana Univ. Med. College, Indianapolis
RELATION TO SURGERY
V. C. Hunt, M.D.....Rochester

A CONSIDERATION OF CERTAIN FEATURES OF ANGINA PECTORIS
F. M. Smith, M.D., Prof. Theo. and Prac. Med. University of Iowa, Iowa City, Ia.

SURGICAL TREATMENT OF PERIDUODENITIS
E. P. Quain, M.D.....Bismarck, N. D.

DIAGONAL END-TO-SIDE ANASTOMOSIS
A. N. Collins, M.D.....Duluth

TREATMENT OF SOME INJURIES AND INFECTIONS OF THE HAND
M. O. Oppegaard, M.D.....Crookston

HYDROCEPHALUS—SURGICAL TREATMENT
E. W. Johnson, M.D.....Bemidji

TWELVE CASES OF TRICHINOSIS
F. S. Richardson, M.D.....Belgrade

THE ANNUAL BANQUET
TUESDAY EVENING, 6:30

Saint Paul Hotel

TOASTMASTER
J. T. Christison, M.D.....St. Paul

"OUR GUESTS"
President C. C. Chatterton, M.D.....St. Paul

"WELCOME"
Mayor Arthur E. Nelson.....St. Paul

"LAND O' LAKES"
Governor Theo. Christianson.....St. Paul

"THE STATE ASSOCIATION"
W. L. Burnap, M.D., Past President.....Fergus Falls
H. M. Johnson, M.D., President.....Dawson
The President-elect

"THE UNIVERSITY"
President L. D. Coffman.....Minneapolis

"ENERGY OF LIGHT"
Chas. H. Mayo, M.D.....Rochester

"OUR PROFESSION"
Chas. P. Emerson, M.D.....Indianapolis

WEDNESDAY MORNING — MAY 19
8:30 o'Clock

Auditorium, Masonic Temple

Joint Meeting—Medical and Surgical Sections

Theodore Bratrud, M.D., and C. B. Wright, M.D., Chairmen

Relation of Retro-Peritoneal Fat to Abdominal Hernia
C. A. Roeder, M.D., Asst. Prof. Surgery, University of Nebraska, Omaha, Nebraska

Clinic on Diseases of the Thorax
W. S. Lemon, M.D.....Rochester
and
S. W. Harrington, M.D.....Rochester

Treatment of Empyema in the Home
H. J. Lloyd, M.D.....Mankato

Associated Hyperthyroidism and Pregnancy
W. A. Coventry, M.D.....Duluth

Installation of Officers

Treatment of Athletic Injuries
C. W. Spears, M.D.....Minneapolis

Branchial Cysts
J. A. Johnson, M.D.....Minneapolis

Ectopic Gestation: Definition, Classification, Consideration
R. J. Hodapp, M.D.....Willmar

Cleft Palate
J. J. Gelz, M.D.....St. Cloud

X-Ray Observations in Pneumonia
L. G. Rigler, M.D.....Minneapolis

WEDNESDAY AFTERNOON — MAY 19
1 o'Clock

Moving Pictures of the Stomach
Lewis Gregory Cole, M.D.....New York City

Symposium on Obstetrics

Maternal Morbidity and the General Practitioner
H. B. Aitkins, M.D.....LeSueur

Sacral Anesthesia in Obstetrics
O. J. Seifert, M.D.....New Ulm

Rural Obstetrics and a Comparative Study of Its Relation to Puerperal Mortality Statistics
W. A. Piper, M.D.....Mountain Lake

Discussion
Roy Swanson, M.D.....Crookston
and
C. O. Maland, M.D.....Minneapolis

Blood Vessel Surgery
J. DeJ. Pemberton, M.D.....Rochester

Clinic on Gastric Diseases
Arnold Schwyzer, M.D.....St. Paul

Surgery of the Infant Abdomen
A. A. Zierold, M.D.....Minneapolis

Urologic Diagnosis in General Surgery
A. E. Sohmer, M.D.....Mankato

Some Abnormal Findings in Diabetes
Donald McCarthy, M.D.....Minneapolis

Blindness Associated with Carbon Monoxid Poisoning
W. R. Murray, M.D.....Minneapolis

On Wednesday evening, May 19, the Ramsey County Medical Society will be hosts to visiting members and ladies with an entertainment and dance. The program will be furnished exclusively by members of the profession and their families.

St. Paul Clinic Week will be limited this year to one day (May 20), the day following the State meeting. Clinics will be held at the Ancker, Miller, St. Joseph's, St. Luke's, St. John's, St. Paul's, Bethesda, Mounds Park, Northern Pacific and Gillette State hospitals. Extensive preparations for a day of valuable clinics are being made by the Ramsey County members. Clinics will be both operative and dry and demonstrations of various instruments and technic will be given by members of the local hospital staffs.

The Women's Auxiliary of the State Association will hold its annual meeting Tuesday at 2:30 p. m. at the Minnesota Club. In addition to the election of officers for the ensuing year the meeting will be addressed by the president, Mrs. J. T. Christison, Dr. Morris Fishbein, editor of the A. M. A. Journal, and Dr. H. M. Johnson, president of the State Medical Association. The annual banquet of the Auxiliary will be held Tuesday evening at the Minnesota Club, Mrs. H. J. O'Brien acting as toastmistress. Auto rides are planned for Monday afternoon, cars leaving the Minnesota Club at 2:00 and 3:30, to be followed by a reception at the Gillette Hospital. Visiting ladies are, of course, invited to the Medical Economics meeting Monday evening and to the Wednesday evening entertainment as guests of the Ramsey County Society.

The various committees of the State Medical Association and the officers of the component county societies as well as the membership of the entire Association appears in the roster published in this number of the journal.

CLINICAL DEMONSTRATIONS AND SCIENTIFIC EXHIBITS

The clinical demonstrations and exhibits will be held at the time and place announced on the bulletin board at the Registration Desk.

Experimental Glomerulonephritis

E. T. Bell, M.D., and B. J. Clawson, M.D., Department of Pathology, University of Minnesota, will show their recent work on experimental chronic glomerulonephritis and embolic glomerulonephritis. In addition they will have a display of hearts showing various types of valvular and muscular disease. Microscopic sections and drawings will be exhibited.

Cancer of Larynx

Dr. Gordon B. New of the Mayo Clinic, Rochester, will have a demonstration of 10 larynx specimens removed at operations for cancer.

Human Intestinal Parasites

T. B. Magath, M.D., of the Mayo Clinic, Rochester, will present a moving picture film of Human Intestinal Parasites.

Bedside Tests for Blood Sugar

Hilding Berglund, M.D., Professor of Medicine, University of Minnesota, will give a demonstration of laboratory

and bedside methods for determination of blood sugar. Colorimeters will be on display and a demonstrator will be in charge.

Immunization Demonstration

W. P. Larson, M.D., Woodard Colby, M.D., St. Paul; E. J. Huenekens, M.D., Minneapolis; D. C. Lochead, M.D., Rochester, will give a demonstration of work with soap in connection with diphtheria, scarlet fever and tetanus. By mixing soap with the above toxins, they are rendered harmless and immunization results in apparently as great a number of instances and in a much shorter space of time than by the usual method. In addition, serum sickness is avoided. This method has been in use for some time, and its value is apparently established. Dr. Larson will show animals injected with pure toxin and other animals injected with toxin and soap. This guinea-pig demonstration is very striking.

Skin Clinic

A skin clinic will be conducted under the direction of H. N. Klein, M.D., and associate clinicians from the Ramsey County Medical Society. Patients will be present and clinicians will discuss the cases with the visiting physicians.

Ophthalmoscopic Demonstration

An ophthalmoscopic demonstration under the direction of J. F. Fulton, M.D., and associate clinicians from Ramsey County Medical Society will be conducted so as to give the visiting physicians an opportunity to make actual examinations. The importance of the use of the ophthalmoscope to the general practitioner will be emphasized.

Demonstration of the Stethophone

Demonstration of the stethophone by S. Marx White, M.D., and associates. This apparatus is a device for broadcasting heart sounds. Each physician should bring a stethoscope with a straight tube for connecting with a monoaural phone. Both normal and abnormal sounds will be demonstrated.

Diagnosis and Control of Diphtheria

Albert J. Chesley, M.D., will show a moving picture film illustrating the diagnosis and control of diphtheria.

SCOTT-CARVER COUNTY MEDICAL SOCIETY

The regular quarterly meeting of the Scott-Carver Medical Society was held April 8, 1926, at Shakopee, Minn., when members were entertained at dinner at the Pelham Hotel by the President, Dr. F. H. Buck.

Dr. E. F. Robb of the Abbott Hospital, Minneapolis, addressed the society on "The Care of Premature Infants and the Treatment of Colic and Eczema in Children."

New members elected were Dr. H. D. Nagel of Waconia and Dr. C. F. Wohlrabe of Young America.

Dr. Herman Johnson, president of the State Medical Association, and Dr. E. A. Meyerding, secretary, were in attendance. Both gave brief talks on the work being done by the State Association as well as plans for the future. A motion was made and carried favoring an increase in yearly State Association dues to $15.

OF GENERAL INTEREST

Dr. G. S. Delamere, formerly of the Mayo Clinic, Rochester, and later of Oakland, California, is now practicing at Marysville, California.

Dr. Julius Jensen, formerly of Starbuck, is now located in Minneapolis, where he has established offices in the Physicians and Surgeons Building.

Dr. and Mrs. Charles N. Hensel of St. Paul left April 15 for Vienna, where Dr. Hensel will take post-graduate work in internal medicine. They will return some time in September.

In addition to the examination held by the American Board of Otolaryngology at Dallas on April 19 and at San Francisco on April 27, another examination will be held at the Otolaryngological Clinic, Royal Victoria Hospital, Montreal, on Tuesday, June 1.

Information may be secured from the Secretary, Dr. H. W. Loeb, 1402 South Grand Boulevard, St. Louis, Missouri.

The new contagious department of the Ancker Hospital, St. Paul, is now under construction. It will be a five-story structure on the north of the present contagious building and will be ready for use in January, 1927. The total bed capacity of the contagious building when completed will be 280.

Dr. H. M. Johnson, president, and Dr. E. A. Meyerding, secretary, Minnesota State Medical Association, recently attended Medical Economics Meetings of the following component societies: Scott-Carver County Medical Society, Mower County Medical Society, Waseca County Medical Society, Freeborn County Medical Society, Steele County Medical Society, Rice County Medical Society and Goodhue County Medical Society. At each of these Societies a resolution was passed endorsing the raising of the dues of the Minnesota State Medical Association from five dollars to fifteen dollars per year. These meetings have attracted considerable attention and secretaries report that they were the largest and best meetings held during the year.

UNIVERSITY NEWS

Announcement was made last month of a gift of $200,000 by William Henry Eustis to the University of Minnesota, in addition to the sum of more than $1,500,000 previously donated for a home and hospital for crippled children.

A gift of $80,000 by Dr. George G. Eitel of Minneapolis in the form of an assignment of insurance policies was also announced. Provision is made in the bequest that the income on the policies shall be paid to his wife during her lifetime, after which the entire sum reverts to the University for the establishment of a medical school scholarship and a research fund.

STATE BOARD NEWS

The State Board of Health requests every practicing physician in Minnesota to assist in eradicating diphtheria. A plan submitted through Dr. H. M. Johnson, President of the State Medical Association, to the proper committees of the Association was endorsed.

This plan provides:

1. That medical societies initiate systematic county-wide toxin-antitoxin work in co-operation with health officers of counties, cities and villages and the school authorities.
2. That public schools be used as inoculation centers.
3. That special effort be made to get parents to protect all children between six months and 12 years of age against diphtheria through the use of toxin-antitoxin.
4. That the records of all children receiving toxin-antitoxin or Schick test, whether of school or pre-school age, be preserved locally in a central file or files.
5. That the county public health nurse, the superintendent of schools or city school nurse have charge of these files and so make them available at all times for reference of the parents, the family physician and health authorities.
6. That in order to promote the general use of toxin-antitoxin a plan similar to the Martin County Medical Society plan be adopted, setting uniform fees for the administration of toxin-antitoxin to individuals in physicians' offices and in homes and for the inoculation of large school groups and of small rural schools. It works well in Martin County.

President Johnson suggests that physicians first give toxin-antitoxin to their own children under 12 years of age and then to children of well informed patrons, thus establishing public confidence in the safety and dependability of toxin-antitoxin.

The diphtheria situation is shown by the enclosed notes, entitled "Diphtheria in Minnesota," prepared by the Division of Vital Statistics and the Division of Preventable Diseases of the State Department of Health, for use in schools and newspapers. Additional information for each county will be sent later to the County Health Officer.

To aid in informing the people about the protection toxin-antitoxin gives against diphtheria, the State Department of Health will loan the one-reel films supplied through the courtesy of the Metropolitan Life Insurance Company and the John Hancock Mutual Life Insurance Company. Transportation charges both ways must he paid by the authorities who use the films. Literature of attractive type prepared by recognized authorities and approved by the State Board of Health for use by local boards of health may be secured by health officers free upon request sent to the home offices of the John Hancock Mutual Life Insurance Company, Boston, Mass., or the Metropolitan Insurance Company, New York City, or from the local representatives of these companies. The presidents of these two companies have instructed their local representatives to co-operate in the campaign against diphtheria.

The State Department of Health, Old Capitol, St. Paul, will mail free of charge upon request of physicians and health officers the required amount of toxin-antitoxin for treatment of the number of children mentioned in the request. Record-consent cards providing for parents' signed consent for inoculation of the child and for history on one side, and for record of inoculations and the Schick test, etc., on the other side, will be supplied free either before the toxin-antitoxin is sent out or with it, as requested by the physician or health officer.

Toxin-antitoxin will be supplied in the kind of package requested as far as funds permit:

(a) 30 c.c. vial.

(b) 10 c.c. vial.

(c) Individual package of 3 vials, 1 c.c. each. As the State pays as much for the individual package as for the 10 c.c. vial, due economy in its use is requested.

Toxin and the saline solution for preparing the Schick test mixture will be mailed free with the following restrictions:

1. One 50 test outfit when request states that 25 to 50 persons are to be tested at once.
2. One 100 test outfit when request states that 50 to 100 persons are to be tested at once.

This restriction is necessary to prevent waste of Schick test material which must be used within twenty-four hours after the toxin is diluted with the saline solution. Outfits containing less material than is needed for 50 Schick tests are not made.

Any county, city or village where toxin-antitoxin work is being carried on or has been arranged for will be supplied with toxin-antitoxin or Schick material, for test of immunity 6 months after inoculation, free of charge upon receipt of a report from the health officer stating what has been done and what supplies are required to continue the work. Any physician desiring toxin-antitoxin for inoculation of residents of Minnesota may secure it free of charge.

Every request must state the number of persons to be inoculated or Schick tested and the kind of package preferred.

Send requests to STATE DEPARTMENT OF HEALTH, Old Capitol, St. Paul, Minnesota.

DIPHTHERIA IN MINNESOTA

Minnesota was one of the first states to apply culture diagnosis as a means of diphtheria control. In New York City, the culture method was first used for diphtheria diagnosis. Dr. W. H. Park, in May, 1893, began routine bacteriological examinations for diphtheria in the New York City health department laboratories. In Minnesota, Dr. Charles N. Hewitt began routine laboratory examinations for diagnosis of diphtheria in October, 1894.

The classification of diphtheria bacilli worked out in the State Board of Health laboratories by Drs. F. F. Wesbrook, L. B. Wilson and O. McDaniel was described in the Transactions of the American Public Health Association, published in 1899. It was at once recognized to be of great practical value and public health laboratories both in America and in Europe have adopted this classification for recording types of B. diphtheriæ in routine microscope examinations of nose and throat cultures.

Antitoxin as a therapeutic agent was introduced in the United States in 1895. Antitoxin had a marked effect on the diphtheria death rates in the Registration Area. The Director of the Federal Census Bureau, commenting on the rates from diphtheria and croup for the Registration states, says the rates "indicate a most remarkable downward trend and stand out as everlasting monuments to the wonderful

progress of medicine. In 1900 the rate was 44 per 100,000 population, in 1910 it had fallen to 25.7 and in 1920 to 19.6. For the age period under 1 year the rate fell from 131.8 in 1900 to 58.6 in 1920 and for children aged 1 to 4 years the rate fell from 270.9 in 1900 to 109.6 in 1920."

In Minnesota, antitoxin was not used extensively for about ten years after its introduction. The continued high death rate led the State Board of Health to take action to make antitoxin available for early use in every case.

In 1906 (November) the Board arranged with Lederle for sale of antitoxin to local health officers at 30 per cent below list price for use among the poor.

In 1909 (April), 55 distributing stations were established.

In 1915 (August), $5,000 appropriated by the legislature for free antitoxin for general use in all cases became available and 283 stations were established.

In 1917, the appropriation was increased to $7,000 per annum.

In 1919, the appropriation was increased to $10,000 per annum.

In 1925, the appropriation was increased to $15,000 per annum.

In Minnesota there are now 370 distributing stations.

Antitoxin reduced diphtheria deaths as its use became general in Minnesota from about 33 in 1900 to about 10 in 1920.

During the past eight years, 1918-1925, there has been at all times an ample supply of free antitoxin throughout the state. Faithful use of our present methods of treatment and control have not caused a continuous reduction in the death rate per 100,000 population or in the deaths per 100 cases.

Diphtheria death rates per 100,000 population of Minnesota

1918	1919	1920	1921	1922	1923	1924	1925
12.2	12.7	10.2	9.1	7.8	8.4	8.6	9.0

Diphtheria fatality rates per 100 cases in Minnesota:

1918	1919	1920	1921	1922	1923	1924	1925
%	%	%	%	%	%	%	%
7.75	6.65	6.72	5.02	4.49	4.76	5.53	6.11

Cases	3,674	4,541	3,616	4,380	4,270	4,431	3,941	3,778
Deaths	285	302	243	220	192	211	218	231

32,631 cases with 1,902 deaths, average fatality 5.8 per cent, occurred in

	Minneapolis		St. Paul		Duluth		State	
Year	Cases	Died	Cases	Died	Cases	Died	Cases	Died
1918	1,007	88	951	59	172	11	1,544	127
1919	920	68	1,308	80	410	20	1,903	134
1920	649	45	938	58	178	15	1,854	125
1921	1,452	51	853	37	200	11	1,875	121
1922	1,276	50	730	35	176	4	2,088	103
1923	1,138	52	1,006	50	141	9	2,146	100
1924	1,332	70	914	34	162	2	1,533	112
1925	1,717	108	805	32	21	0	1,235	91

Deaths per 100 cases: Minneapolis, 5.6; St. Paul, 5.1; Duluth, 4.9; State, 6.4.

Age	Cases	Per Cent of All Cases	Deaths	Per Cent of All Deaths	Deaths per 100 Cases
Under 5	4,881	14.95	687	36.12	14.1%
5-9 yrs.	9,222	28.26	692	31.12	6.4%
10-14	6,091	18.66	245	12.88	4.0%
15-19	2,941	9.01	97	5.09	3.3%
20 and up	7,753	23.75	281	14.77	3.6%
Unknown	1,743	5.36	0		
Under 1 yr.	445	1.36	68	3.57	15.3%

This group is included in the group "Under 5" above.

Diphtheria can be eradicated if the discoveries of scientific medicine are systematically and persistently applied. Its cause and its mode of spread are known. A means for exact diagnosis, a scientific remedy for treatment which also gives temporary immunity, a reliable test for susceptibility, a safe agent for producing lasting immunity, are all at hand. Under these circumstances why permit our children to run the risk of sickness and death that the diphtheria statistics of Minnesota, 1918-1925, show?

TOXIN-ANTITOXIN

Diphtheria toxin-antitoxin, as the name implies, is a combination of diphtheria toxin and diphtheria antitoxin. Its use to protect children against diphtheria was first suggested by Dr. Theobald Smith in 1907, who discovered, quite accidentally, in his work on the standardization of diphtheria antitoxin for the Masachusetts State Board of Health that guinea pigs receiving both toxin and antitoxin remained immune for at least 2 years.

In 1913, Dr. von Behring in Berlin first used toxin-antitoxin to immunize human beings. In 1914, Dr. W. H. Park, Director of Laboratories of the New York City Health Department, began to manufacture and use toxin-antitoxin. Through the efforts of Dr. Park and his co-workers, the production and standardization of this product have been perfected and the value of this method of immunization has been demonstrated.

In 23 representative American cities where the death rate since 1918 has fallen an average of 10.3 per cent each year, the fall has been coincident with the general application of toxin-antitoxin by the health departments.

In New York City, the diphtheria death rate per 100,000 population dropped from 18.4 in 1920 to 11.9 in 1924. This reduction coincided with the immunization of 350,000 children since 1920. In the face of increased population, diphtheria deaths dropped from 1,239 in 1919 to 714 in 1924 and reported cases from 14,000 to 9,700.

In Syracuse, N. Y. (population 172,000), as a direct result of the administration of toxin-antitoxin to large numbers of children, the diphtheria death rate fell in 1925 to 2.6 from a rate of 9.0 in 1924, the lowest previous rate in the city's history.

In New Haven, Conn. (population 163,000), the diphtheria death rate was 1.7 per 100,000 population while the rate for the state of Connecticut was 11.2. The decline in New Haven followed an intensive immunization campaign of several years' duration while no corresponding campaign was carried out in the state as a whole.

In Seneca Falls, N. Y. (population 6,000), there had been an average of 22 cases among school children during each of the 5 years preceding the use of toxin-antitoxin. During the year following its use there was but one case among children.

In Youngstown, Ohio (population 132,000), following a campaign of immunization in which 22,000 children were immunized, there were 316 cases and 27 deaths in 1924 compared with 1,025 cases and 147 deaths in 1923.

Martin County was the first county in Minnesota to adopt a systematic county-wide program for immunization against diphtheria. Over 2,300 or about 90 per cent of the school children and hundreds of pre-school children received three doses of toxin-antitoxin in 1925.

THE SCHICK TEST

As diphtheria bacilli grow they produce a poisonous substance called toxin. If a very tiny amount of this toxin is injected into the skin of an immune person nothing happens, but if a similar amount is injected into the skin of a susceptible person after a short time the skin becomes reddened and a little swollen about the point of injection.

The Schick test in this way will tell us who is susceptible and who is immune to diphtheria. From 75 to 80 out of every 100 adults are immune to diphtheria. At birth about 75 to 80 of all infants are immune to diphtheria. The rule is if the mother is immune the offspring will be immune, and if the mother is susceptible to diphtheria the offspring will be susceptible, also. The newborn infant gradually loses the protection, immunity, transmitted to him from his mother and becomes quite susceptible at or before the age of two years. From the second to the sixth year the larger number of children are most susceptible to diphtheria. It is therefore apparent that ideally children should receive toxin-antitoxin immunization between the ages of 6 months and 2 years. In the campaign for the immunization of school children this fact should not be forgotten.

Dr. W. H. Park said, in an address at the Annual Meeting of the State Committee on Tuberculosis and Public Health of the State Charities Aid Association, New York City, May 8, 1925:

"What I want you all to believe is that toxin-antitoxin is in little children a harmless preventive against diphtheria. Here in New York City some time ago we gave each of two thousand infants when three days old a full man's dose without the slightest harm. The younger the child, the greater the need and the less the reaction. Don't wait until the child reaches school age. The great mortality is in the little children of the first, second and third years of age."

At the State Sanitary Conference last November, the health officers of Minnesota requested the State Department of Health to supply toxin-antitoxin and material for Schick test free of charge throughout the state.

The State Board of Health acted favorably on this request at its January meeting and will issue free of charge upon request of physicians and health officers the materials for immunization against diphtheria.

The Board will co-operate with the school and health authorities and the county medical societies throughout the state for the purpose of giving protection to school children and especially to children between 2 and 6 years of age who, as shown by the statistics, have the highest death rates from diphtheria.

NEW AND NON-OFFICIAL REMEDIES

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

CUTTER LABORATORIES:

Typhoid-Paratyphoid Prophylactic

EFFICIENCY PRODUCTS CO.:

Hoffman's Non-Nutritive Nut Flour

MEAD, JOHNSON & CO.:

Mead's Powdered Lactic Acid Milk (Cultured)

Mead's Powdered Lactic Acid Milk (Acidified with Lactic Acid U.S.P.)

H. K. MULFORD CO.:

Carbon Tetrachloride-Mulford

Capsules Carbon Tetrachloride-Mulford, 0.3 c.c.

Capsules Carbon Tetrachloride-Mulford, 1 c.c.

Capsules Carbon Tetrachloride-Mulford, 3 c.c.

PARKE, DAVIS & CO.:

Parke, Davis & Co.'s Standardized Cod Liver Oil

SQUIBB & SONS:

Scarlet Fever Streptococcus Antitoxin-Squibb, for the Blanching Test, 1 c.c. vials

SWAN-MYERS CO.:

Concentrated Pollen Extracts-Swan-Myers, 2 c.c. vials; capillary tubes

TRUTH ABOUT MEDICINES

Hoffman's Non-Nutritive Nut Flour.—A preparation prepared from Tagua palm nuts, composed chiefly of unassimilable carbohydrates (mannans). This product is used as a means of filling out restricted diets. It is a non-nutritive food substance used to give bulk to foods, thus serving to satisfy hunger without furnishing nourishment. Efficiency Products Co., Somerville, N. J. (Jour. A. M. A., Mar. 20, 1926, p. 842.)

Carbon Tetrachloride-Mulford.—A brand of carbon tetrachloride-U.S.P. It is marketed in the form of capsules containing, respectively, 0.3 c.c., 1 c.c. and 3 c.c. H. K. Mulford Co., Philadelphia. (Jour. A. M. A., Mar. 20, 1926, p. 842.)

Ragweed Combined Pollen Antigen-Lederle.—For a description of the method of preparation and the form of marketing, see New and Non-official Remedies, 1925, p. 287. Lederle Antitoxin Laboratories, New York. (Jour. A. M. A., Mar. 20, 1926, p. 842.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of February 10, 1926

The Minnesota Academy of Medicine held its regular monthly meeting at the Town & Country Club on Wednesday evening, February 10th, 1926, at 8 o'clock. Dinner was served at 7 o'clock. There were 28 members present.

The meeting was called to order by the President, Dr. H. L. Ulrich.

The minutes of the January meeting were read and approved.

This meeting was given over entirely to the presentation of clinical case reports, and the following members reported cases:

Dr. F. L. Adair reported two cases as follows:

Case 1. Mrs. H., age 23. Patient had a normal menstrual period in November. The December period was a few days late. She had a fainting spell, and on one occasion complained of headache and soreness of the eyeballs. The diagnosis was: possible pregnancy, with threatened abortion. On January 26, 1926, the patient came to the office. She had flowed from January 22nd to 24th; not quite so much as normal, and no pain. She complained of dizziness and syncope, and lacked endurance. She had slight nausea in December after the fainting spell. She fainted on January 21st. Had headaches occasionally.

The pelvic examination was negative. Vagina: slight, thin, pinkish discharge. Adnexa: elongated mass in the right adnexal region, about 3 to 4 cm. in diameter. Diagnosis: tubal pregnancy.

On January 28th she was operated upon; hydrosalpinx. Median abdominal incision was made, omental adhesions were freed, the right hydrosalpinx was removed, and right salpingectomy. No drainage.

Case 2. Mrs. S., aged 43. Patient was first seen in April, 1922, aged 39, married 3 years, no pregnancies. She complained of constant pulling, dragging pain in the hypogastric region when on her feet. A generalized urticaria and generalized brownish pigmentation were noted. Her menses had occurred regularly every 4 weeks, duration 6 days, and associated with cramps in the lower abdomen during the flow.

The physical findings were negative with the exception of a third degree retroversion of the uterus and possible gastroptosis. A pessary was inserted to correct the retroversion. This treatment was continued until April, 1925, when the pessary was removed. The patient was improved.

The skin condition improved after vaccination in November, 1924, but troubled her again in March, 1925, especially with menses.

The patient was seen in August, 1925. She was very nervous. She was about two and a half weeks past her period, and the last time had gone over about ten days. The uterus was about normal in size, retroflexed and retroverted third degree, not enlarged or softened, and no bluish coloration.

The patient was not seen again until December 18, 1925. She had had a normal menstruation in September and had been spotting ever since. The afternoon of December 18th she was seized with a sudden pain in the abdomen, felt faint, and went into collapse, and was found on the floor. Dr. J. D. was called and found the patient in a serious condition, pale, rapid pulse, and some shock. A mass was palpable in the right lower quadrant of the abdomen, with considerable tenderness. Dr. J. D. called me about 7:30 p. m. and I saw the patient about 8 p. m., at which time her pulse was almost imperceptible at the wrist. She was very pale and had thirst and air-hunger. Her blood pressure was between 30 and 40 systolic. She was immediately sent to the hospital and given a hypodermoclysis of normal saline solution. She was operated upon under gas and local anesthesia.

The uterus was found with a large mass in the right horn, which had two points of rupture, bleeding into the peritoneal cavity. This mass was delivered through the incision and a supracervical hysterectomy was done. Some blood was removed from the abdomen, mixed with citrate solution and replaced. Following the operation, the patient was very restless, went into collapse and died.

Gross findings: A tender mass in the right lower quadrant of the abdomen. Peritoneal cavity was full of blood. Connected with the right horn of the uterus was a large mass so that the uterus was about three times normal size.

Final diagnosis: Intraperitoneal hemorrhage; probably ruptured interstitial pregnancy.

Dr. Emil S. Geist reported two cases of foreign body in the knee joint under the semilunar cartilage.

Dr. A. Schwyzer reported a case of carcinoma of the fundus of the gallbladder, and a case of carcinoma of the stomach.

Dr. Harry P. Ritchie showed a series of pictures of before and after operations upon congenital cleft lips. The results indicated that in the repair of this cleft the procedure was not a special hare-lip operation, but one of general surgery, i. e., the union of a cleft sphincter muscle —the obicularis oris. The exact outlines of this muscle could be demonstrated by the use of the faradic current.

The results, not only in function, but in looks and growth, depended upon the precision with which this union was accomplished.

Dr. A. E. Benjamin reported three goiter cases as follows:

Case 1. Mrs. C. E. McK., aged 33, married, weight 97¾ pounds. Complained of nervousness, insomnia, nausea and vomiting, diarrhea, tremor of hands and loss of weight. She had had diseased tonsils removed November 20, 1925. She had had appendicitis as a child, and smallpox at the age of 23. She had had asthma for 10 years.

Physical examination: Head: hair abundant, acne on the face, eyes bulging, staring, nystagmus. The neck showed an enlarged thyroid, right lobe larger than the left. Lungs were normal. Heart: rate 120, blood pressure, 170/80. Skin: iodism.

Laboratory: Urine: 12/12/25 normal. Blood: 1/16/25, Hb. 78%, w.b.c. 6,800. Blood urea 50.92. Basal metabolism: 10/18/25, 60% plus: 12/24/25, 45%.

She was given Lugol's solution by rectum, luminal, quinin hydrochlorate, bromides, and special diet.

Thyroidectomy was performed 12/29/25. Pathological report: colloid and fetal adenomata.

While in the hospital the pulse and blood pressure came down to normal in two days, no fever, and the patient made excellent progress. In four weeks she weighed 103¾ pounds.

The interesting points in this case are: (1) The pronounced toxic symptoms—loss of weight, diarrhea, vomiting, high blood pressure, rapid pulse, inability to take Lugol's solution by mouth, and high basal metabolism. (2) The regaining of weight and normal health.

Case 2. Miss G. E. V., aged 19, single, weight 110 pounds, height 5 ft. 7 in. Patient complained of tremor, nervousness, insomnia, difficulty in swallowing, loss of weight, and goiter.

The patient was told that she had a goiter as a child. This fall she noticed the glands enlarged and so consulted a doctor, who prescribed Lugol's solution last September. During the last month she became nervous, had nervous spells in which she had tremor of the hands, sensations of choking, and then fainted. Patient lost 10 pounds this winter. She becomes easily fatigued. Her hands often tremble and perspire freely. Her eyes blur and ache.

The patient had measles and diphtheria as a child; influenza in 1918, and has had tonsilitis frequently. Her menses began at the age of 15, pains during and after, irregular 10 to 40 days, duration 4 days.

Physical Findings: Eyes, frequent winking, nystagmus, lid lag, staring. Tonsils, inflamed, cryptic and submerged. The thyroid is definitely enlarged, right lobe nodular. Heart, rate 90; blood pressure 114/80. Lungs negative. Breasts have small palpable nodules. Reflexes normal. Skin is ruddy, warm and moist. There was acne present. The uterus is retroflexed, movable and of normal size. The ovaries are prolapsed.

Laboratory: 1/11/26, Hb. 85%, w.b.c. 7,100. 2/9/26, Hb. 90%. Urine. 1/11/26, negative. Basal metabolism, 1/11/26, plus 03%. Eight days after operation plus 37%.

Thyroidectomy was performed 1/12/26. Both lobes were enlarged about two and a half times the normal size, the right being irregular and nodular. The left lobe extended more posteriorly than the right, and was uniformly enlarged.

Tissue report: Section showed acini very large and containing deeply staining colloid. Cells were low cuboidal. There were nests of round cells in the interstitial tissue which may indicate past activities.

Course in the hospital: Before the operation the pulse was 90, temperature 98.6, respiration 20. After the operation the pulse was 130, temperature 102, respiration 28, for five days. Then the pulse was 120, temperature 99, and respiration 28, for eight days. Then, for three days, pulse was 100, temperature 98.6, and respiration 25. After that the pulse was 90, temperature normal, and respiration 22.

After leaving the hospital, the blood pressure was 100/50 on 2/9/26, and the pulse was 84.

The interesting points in this case are: (1) Goiter symptoms, but the preoperative basal metabolism was plus 03; (2) Postoperative at eight days, the basal metabolism was plus 37, pulse rapid and patient very nervous; (3) Return to practically normal health and absence of nervous symptoms at the present time.

Case 3. Mrs. A. C. U., aged 41, married, weight 175 pounds. Complains of nausea and vomiting, constipation, nervousness, sallow skin, and backache.

The patient had had measles, scarlet fever, smallpox, and rheumatic fever as a child, and diphtheria at the age of 20, and influenza in 1919. She had had an appendectomy and salpingectomy in 1907, and tonsillectomy in 1919. She has bronchitis during the winter. She had had eczema on the scalp and ears for months. Has had backache for years.

She smokes about ten cigarettes daily, and drinks liquor at times. Her father died at 68 of gastric cancer, and one sister died of pulmonary tuberculosis.

Physical examination: The skin is sallow and icteric; eczema on the scalp and ears. The eyes are staring. Teeth negative. The thyroid is enlarged. Blood pressure 124/80. Abdomen: tenderness and resistance along the right costal margin. The liver is high and the liver outline is smaller than normal. Leucorrhea. Rectum is tender.

Laboratory: Urine normal 1/19/26. Blood Wassermann negative. Blood: 1/18/26, Hb. 70%, w.b.c. 7,300, r.b.c. 4,460,000. Basal metabolism 1/2/26, 12 plus.

X-ray showed no evidence of ulcer in stomach or duodenum. Chronic gallbladder pathology.

Pathological: There is a slight intralobular infiltration with round cells, some areas showing a little hemorrhage. The liver cells are rather pale. I do not know the cause, but some degeneration often occurs with gallbladder diseases. (Grave.)

Operation: Pylorus patulous. Adhesions were found beyond the pylorus around the duodenum, but no sign of ulcer. The middle portion of the ascending colon was restricted and held down in the upper abdomen, resulting in kinking. Small nodules through the liver resembled small stones which can be palpated and apparently moved from their location. The liver is mottled and smaller than normal. The right ovary is cystic and there is compensatory hypertrophy. The left ovary is 1½ inches in diameter, irregular, and fibrocystic. Small subserous fibroids, the size of a pea, were found on the uterus. Cholecystotomy was performed.

Progress in hospital: bile drainage for ten days. Patient vomited for five days after operation.

Interesting points in this case are:

1. Some symptoms of diseased thyroid; basal metabolism plus 12.
2. Definite symptoms of gallbladder disease before operation.
3. The lack of pronounced pathology of the gallbladder.
4. Definite liver pathology.
5. Apparently returning health.

Dr. H. L. Ulrich reported two cases of eventration of the diaphragm, one of the right side and the other of the left side. X-ray plates of both cases were shown.

Upon motion the meeting adjourned.

John E. Hynes, M.D.
Secretary.

CASE REPORTS

Members are requested to report interesting and unusual ses for publication in this department. Many cases ported at hospital staff meetings and similar meetings are ry instructive and worthy of publication.

FLAMMATION FROM DUODENAL ULCER, WITH OBSTRUCTION OF THE COMMON BILE DUCT*

REPORT OF CASE

SAMUEL F. HAINES, M.D.
Rochester, Minnesota

The patient, a woman aged fifty-eight, registered at the inic April 6, 1925. The family and early histories were nimportant. At thirty-three she had had severe pain in ıe upper right quadrant which had recurred at intervals ɔr five years, when the gallbladder, with stones, and the ppendix were removed at this clinic. Following this she ad been in good health until ten years before her last exmination, when there was mild pain in the upper right uadrant. Similar attacks had recurred twice since then. The present trouble began with slight soreness in the epiastrium four days before the patient's admission and later sudden, severe, colicky, epigastric pain, radiating directly o the back. The pain was intermittent, occurring in fiveninute spells, and was severe enough to require morphine. The following day yellowness of the skin was noted, and here was intense generalized itching. The pains continued ıt intervals until the day before the patient's admission. On this day there were occasional chills and the temperaıure on one occasion was 102°.

Examination revealed slight jaundice of the skin and sclerotics. There was slight tenderness in the right upper abdominal quadrant and the liver edge was just palpable. During seven days while the patient was in the hospital the temperature was 98 to 99° except on one occasion, when it rose to 100.5°. The urine showed a slight trace of albumin; very few hyalin and granular casts were present. Bile was definitely present. There was slight leukocytosis, the leukocyte count being 12,200. The serum bilirubin was 8.3 mg. for each 100 c.c. Fluids were forced, and 5 c.c. of calcium chlorid, 10 per cent, was administered intravenously once daily for three days. A tentative diagnosis of choledocholithiasis was made. April 13 the coagulation time by the Lee method was seven and one-half minutes. The urine no longer contained bile.

The patient was operated on April 14. Exploration revealed pancreatitis. The head of the pancreas was almost 8 by 8 by 5 cm., and contained some disintegrated fat. There was a chronic penetrating ulcer of the duodenum with many adhesions and much old inflammatory material about it. No stones were felt. The common bile duct could not be isolated from the mass of adhesions. After suturing over the ulcerated area, which was situated on the anterior wall of the duodenum just below the pylorus, posterior gastro-enterostomy was performed.

Two days after operation (April 16) the serum bilirubin had fallen to 1.97 mg., and on April 22 to 0.85 mg. The patient made an uneventful recovery and was relieved of her trouble.

Penetrating ulcer of the duodenum is frequently given as one of the causes of obstruction of the common duct resulting in jaundice, but the condition seen here is not often encountered. In this case it is impossible to say how much the ulcer had to do with the obstruction of the common duct, as the head of the pancreas was considerably enlarged. It is possible that the ulcer and pancreatitis existed independently; on the other hand it is also possible that the enlargement of the head of the pancreas was secondary to the inflammation in the duodenum, produced by the ulcer.

Two days after the gastro-enterostomy the serum bilirubin had dropped from 8.3 to 1.97 mg. While this would suggest that the inflammatory reaction causing the obstruction of the common duct had subsided very rapidly and would seem to be evidence that the obstruction was the result of the ulcer, it would be interesting to follow this case. If there should be no return of the trouble it would certainly appear that the ulcer in the duodenum had been the cause of the whole difficulty.

*From the Division of Medicine, Mayo Clinic.

MUCOCELE OF THE APPENDIX

REPORT OF CASE

FREDERICK CHRISTOPHER, M.D., F.A.C.S.
Winnetka, Illinois

Cystic dilatation of the appendix is a relatively rare condition. Since it was first described by Virchow in 1863, some one hundred and sixty cases of various types have been reported in the literature. Its occurrence is dependent upon a slow stenosis of some part of the lumen of the appendix, and the appendiceal mucosa which secretes rapidly. In some cases there is such change in the mucosa that the normal secretion becomes colloidal pseudomucus, and in some probable sterility of the lumen distal to the stenosis. It is believed by some that a low grade inflammatory process participates in the etiology. The condition is generally acquired, but may be congenital. The mucocele may become as large as a man's head and the contents may be serous, turbid, blood-tinged, mucoid, gelatinous or pseudo-myxomatous. In the "fish egg" type, balls of inspissated mucoid material float in the fluid contents of the mucocele.

Certain types of mucocele of the appendix are considered to be potentially a malignant disease, because rupture of the cystic mucocele may cause a reactionary peritonitis of a progressive character known as pseudo-myxoma peritonei. These "metastases" do not occur unless the cyst ruptures and the contents become implanted upon the surface of the peritoneum. Here the contents (Boyd) causes "a proliferation with formation of large masses like frogs' spawn. The condition is probably due to the implantation of the

epithelial cells on the peritoneal surface, where they continue to produce their mucinous secretion. The progress of this disease is unfavorable, but removal of the appendix may check it." The only cause of pseudo-myxomatous peritonitis in the male is mucocele of the appendix. In the female, it may be caused either by a mucocele of the appendix or a cyst of the ovary.

The symptoms of pain and tenderness in the right lower quadrant have been present as long as three years before operation. Occasionally, a mass may be felt on examination. The differential diagnosis requires the consideration of ovarian cyst, hydrosalpinx, pyosalpinx, malignancy of the intestine, mesenteric cysts, intussusception, hydronephrosis, retroperitoneal cysts, renal cyst, perinephritic abscess, movable or tuberculous kidney, uterine fibroid, diverticulum of the cecum.

The following is the report of a case:

Ethel H. Age 18. At 6 P. M. on the day previous to admission, the patient became conscious of a dull aching pain in the center of the abdomen below the umbilicus. At 9 P. M. the patient became nauseated. This persisted, but there was no vomiting. The pain was severe enough to keep patient awake. The patient said that she has had many attacks similar to the present one. The last previous attack was in November, 1925, when she was confined to bed for five days. Past history negative. The physical examination was negative save for a moderate amount of tenderness in the right lower quadrant in the region of McBurney's point. There was little if any rigidity. The temperature was normal, the urine was normal.

The patient was admitted to the Evanston Hospital on January 2, 1926, for observation. Three successive leukocyte counts in twenty-four hours were 9,800, 10,200, 10,400. Operation was performed on January 4, 1926. The abdomen was opened by McBurney's incision. The appendix was found to be greatly distended and firmly adherent to the cecum. Its adhesions were made up of dark red fibrous material. The appendix was cautiously freed and removed with inversion of the stump, which was of normal diameter. The patient made an uneventful and rapid convalescence and was discharged from the hospital January 13, 1926.

Pathological Report (Dr. J. L. Williams): A markedly edematous and swollen appendix 6.2 x 1.6 cm. in the maximum. The serosa is hyperemic, hemorrhagic, and torn in some places, as its fibrous adhesions had been attached. The lumen is markedly distended with clear mucus except in the distal portion, where there is a little muco-purulent material. At the proximal end the lumen is obstructed as if from scar tissue and also 1.5 cm. from the distal end, where it is practically occluded. Microscopic: Sections of this appendix disclose a marked increase of the fibrous tissue of the wall with extensive lymphocytic invasion. In some sections there is extensive leukocytic infiltration and many polymorphonuclear eosinophiles. The serosa of the latter portions contains a considerable amount of exudate in places. The lumen of the distal portion is completely obliterated and replaced by extensive fibrous tissue with many lymphocytes. Diagnosis: Chronic appendicitis with acute exacerbation.

I. BIBLIOGRAPHY

1. Myers, W. H.: Ill. Med. Jour., May, 1925, 386.
2. Boyd, William: Surgical Pathology. Saunders, 1925 333.
3. Collins, C. V.: Ill. Med. Jour., 1924, 16, 221.
4. Davison, Marshall: Internat. Clin., 1922, 2.
5. Bailey, P. W. Surg., Gyn. and Obst., 1916, 23:219.

II. ADDITIONAL RECENT BIBLIOGRAPHY

Blandini, N.: Un caso di appendicocele strozzato. Policlin., Roma, 1923, 30, 1590.

Chevrier, L.: Sur un case d'appendicite kystique diverticulaire. Bull. et mem. Soc. de chir. de Par., 1917, 43, 789.

Cobbett, L., and Keilin, D.: Mucoid casts from vermiform appendix. Jour. Path. and Bacteriol., 1923, 26, 297.

Flecker, M.: Retentionscyste des Proc. vermiformis. Zentralbl. f. Gynak., Leipz., 1918, 42, 307.

Fleischer: Bericht uber einen eigenartigen Zufallsbefund (Pseudomyxom der Appendix). Monatschr. f. Geburtsh. u. Gynaek., Berlin, 1923, 43, 155.

Fulle, C.: Cisti dell'appendice vermiforme. Riv. di chir., Como, 1922, 1, 110.

Ferg, E. J., and Chestnut, W. A.: A case of acute obstruction due to cystic dilatation of the appendix (hydrops of appendix). Can. Med. Assn. Jour., 1922, 12, 108.

Lemanski, W., and Jaubert de Beaujeu, A.: Un cas de retention appendiculaire prolongee. Bull. et mem. Soc. radiol. med. de France, Par., 1923, 11, 126.

Lohr, W.: Zur Frage des Wurmforsatzdivertikels und seiner Folgezustande, insbesondere des Pseudomyxoma peritonei. Deutsche Ztschr. f. Chir., Leipz., 1922, 171, 30.

Mazzini, O. F.: Pseudomyxoma of appendicular origin. Rev. Asoc. med. argent., Buenos Aires, 1922, 70, 492.

Megevand, E. C.: Giant appendix packed with colloid grains (myxoglobulosis). Rev. med. de la Suisse Rom., Geneve, 1925, 45, 525.

Michaelsson, E.: Peritoneal pseudomyoma originating in appendix. Acta chir. Scandinav., Stockholm, 1921, 53, 441.

Milliken, G., and Poindexter, C. A.: Mucocele of appendix with globoid body formation. Am. Jour. Path., 1925, 1, 397.

Morlot, R., and Mathieu, C.: Mucocele geant de l'appendice cæcal. Bull. et mem. Soc. anat. de Par., 1923, 113, 333.

Muller, G.: Pseudomucinous ovarian cyst combined with gelatinous degeneration of the vermiform appendix. Contribution to the so-called pseudomyzoma peritonei and to possible malignancy of the pseudomucinous cyst. Bratisl. lek. listy, Praha, 1923-24, 3, 152, 3 pl.

Oudard and Lancelin: Un cas d'appendicite kystique. Bull. et mem. Soc. chir. de Par., 1922, 48, 1199.

Porter, H. K.: Mucocele of appendix. Med. Jour. Australia, Sydney, 1924, 2, 252 (illus.).

Richter, H.: Schleimretention im distalen Abschnitt des proximal obliterierten Wurmfortsatzes mit Durch-

bruch in die freie Bauchhohle. Centralbl. f. allg. Path. u. path. Anat., Jena, 1924-25, 35, 362.

Riff, A.: Sur la presence d'Amœba coli dans un kyste de l'appendice et sur son role possible dans l'etiologie de ce kyste. Compt. rend. Soc. de biol., Par., 1920, 83, 238.

Rosati, B.: Contributo alla conoscenza del pseudomyxoma di origine appendiculare. Ann. ital. di chir., Napoli, 1922, 1, 704.

Sencert, L., Masson, P., and Allenbach, E.: Mucocele geant de l'appendice. Gaz. med. de Strasb., 1922, 80, 208.

Simon, S.: Mucocele of appendix. Deutsche Ztschr. f. Chir., Leipz., 1924, 186, 1.

Steinsleger, M.: Pseudo-myxoma de origen apendicular. Rev. med. del Rosario, 1922, 12, 279.

FIBROMA OF THE OVARY

REPORT OF CASE

H. M. N. Wynne, M.D.
Minneapolis

R. G., age 29, white, female, married, never pregnant.

Two hours after arising on the morning of Aug. 25, 1925, the patient felt a sudden pain "like a strain" in the lower left side of the abdomen. This pain grew progressively worse during the day and she had some nausea but no vomiting. There were no other symptoms.

In 1917 the appendix and two-thirds of each ovary (said to be large cystic ovaries) had been removed and the uterus suspended. I had examined this patient very satisfactorily several times and never felt any enlargement of either ovary before the present illness. The last examination was made two years ago.

Menstruation began at eleven years, occurred regularly every twenty-eight days, lasted one to three days, and was unaccompanied by pain until after the operation in 1917.

Examination in August, 1925, revealed a normal pulse and temperature. The abdomen was normal except for a little tenderness over the left lower quadrant near the ilium. Immediately behind the uterus there was a tender, firm, rounded tumor about the size of a tennis ball. The uterus was apparently normal in size, shape and consistency, but the posterior surface could not be felt. By careful manipulations the tumor was lifted up out of the cul-de-sac and the patient had immediate relief.

While under observation the following two months the tumor apparently decreased somewhat in size, but was always felt behind the uterus at each examination. She had no further attacks of pain.

A definite diagnosis was not made. The tumor was thought to be either a solid tumor of the left ovary or a pedunculated myoma attached to the posterior of the body of the uterus. The *x*-ray did not show the tumor, but a pressure defect at the junction of the rectum and sigmoid was seen.

At operation, on October 29, a fibroid tumor of the right ovary and seven small uterine myomata were removed. The pedicle was not twisted. There was no free fluid in the abdomen. The tumor was almost spherical and measured 5 cm. in diameter. Microscopic examination was made by Dr. J. S. McCartney, Jr., who found a pure fibroid of the ovary.

DISCUSSION

The growth of the tumor to its present size was made in two years or less. The tumor may have originated in the scar following the operation for resection of the cysts. There was no free fluid in the peritoneal cavity. The pain complained of was in the left pelvis while the tumor was found in the right ovary. The pain was probably due to the incarceration of the tumor in the cul-de-sac. There may have been some edema of the tumor while it was incarcerated in the cul-de-sac, which would account for the apparent decrease in size after it was lifted up in the pelvis.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:

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THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

THE TENSION THEORY OF PLEURITIC PAIN:

H. A. Bray (The American Review of Tuberculosis, 1926, XIII, 14). There are two well-known theories regarding the mechanism of pleural pain. One, the more generally accepted, ascribes pleuritic pain to friction due to roughening of the pleural surfaces by inflammatory exudate. The other attributes the pain to tonic contraction of the hyperalgesic intercostal muscles. Bray in this article discusses a third: the tension theory, so termed because it attributes pleuritic pain to tension or stretching of the inflamed parietal pleura. The presence of sensory nerve end bulbs has been demonstrated in the parietal pleura, although the visceral layer is insensitive. In acute pleurisy there is usually agonizing pain on inspiration and relief on expiration. Pleurisy at the apex is less likely to be accompanied by pain than at the base. The posture of the patient in pleurisy may be interpreted as Nature's effort to relieve pain. In costal pleurisy the patient bends his body toward the affected side. This position approximates the ribs and lowers the tension of the costal pleura. If a patient lies in a sagging bed on the healthy side the under ribs are separated and the ribs on the diseased side are approximated, thereby relieving tension of the diseased pleura. In certain cases of diaphragmatic pleurisy, the posture resem-

bles that of acute peritonitis. The patient lies on his back, quite still, with the knees flexed, the abdominal muscles rigid and the diaphragm partly or completely immobilized.

The adherents of the friction theory believe that cessation of pleuritic pain with the advent of an effusion is due to the elimination of friction. This now is questioned because in artificial pneumothorax pleuritic pain likewise subsides with an effusion. Here elimination of friction is obviously not a factor in the cessation of pain. The effusion denotes that the inflammation has entered the exudative stage and one may possibly attribute the cessation of pain to the consequent relief of pressure on the nerve terminals of the pleura. Moreover, in ordinary pleurisy with effusion, the fluid, by immobilizing the ribs, prevents tension of the pleura and hence contributes to the relief of pain.

A. T. Laird, M.D.

SURGERY

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DONALD K. BACON,
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GASTRIC RESECTION AND VARIOUS METHODS OF RE-ESTABLISHING THE CONTINUITY OF THE GASTRO-INTESTINAL TRACT: George Halperin (Int. Abstract of Surg., Feb., 1926; 42, 2, p. 87). The history of gastric resection began in 1879 with Pean, who first resected a stomach for pyloric cancer and joined the stomach and duodenum end to end. The difficult problem has always been the re-establishment of the continuity of the gastro-intestinal tract after the removal of the diseased part. The methods employed fall into four groups:

Group 1. End to end anastomosis. First attempted by Pean in 1879, then by Rydigier in 1880, both attempts unsuccessful. Billroth in 1881 was successful and the method became known as the Billroth 1. Physiologically, it is an ideal operation. Practically, it is difficult to avoid tension and to prevent leakage at the so-called "fatal suture angle," the angle resulting from the anastomosis of the two segments of different diameters. For a time the method was in disrepute, but there has been a partial return to it, owing largely to technical advances in the mobilization of the duodenum and stomach.

Sleeve resection, proposed by Riedel in 1904, has been given a wide application. Its disadvantages are late occurrence of contraction, recurrence of ulceration, and the formation of adhesions to the pancreas.

Group II. Side to end anastomosis. Introduced by Kocher in 1890. The stomach was resected and sewed up, and the end of the duodenum was implanted into the stomach posteriorly. The method was soon abandoned because of technical difficulties.

Group III. Side to side anastomosis. (Billroth II.) Proposed by Billroth in 1885 for cases requiring extensive resection. After resection both stumps are closed and a gastro-enterostomy is performed. It possesses no advantages over the Billroth I, and is technically more difficult.

Group IV. End to side anastomosis. Known in English and French literature as the Polya operation. It was first proposed by an assistant in Billroth's Clinic, von Hacker, in 1885, and first performed by Kroenlein in 1887. The method, at present, seems to have supplanted all others. The antecolic method, with a long loop, is used only in exceptional cases, for example, when there is a short mesocolon. In such cases Braun's entero-anastomosis is usually added.

The advantages of this method are (1) ease of performance, (2) security of suture line, (3) physiologically favorable conditions for emptying of the stomach, and (4) it is time saving.

H. E. Simon, M.D.

TUBERCULOSIS OF THE MAMMARY GLAND: Arthur M. Shipley and Hugh R. Spencer (Annals of Surgery, 83, 2, p. 175). A review of the literature emphasizes the infrequency of this condition, the incidence reported varying from .51 per cent to 1.7 per cent of all breast lesions. Of 180 collected cases, 120 presented no clinical evidence of tuberculosis elsewhere. The period of most frequent occurrence is between the ages of 20 and 50. The condition is practically always unilateral and is often confined to one quadrant of the breast. The axillary lymph nodes are involved in from 60 per cent to 75 per cent of the cases.

There are three main types: (1) Nodular, (2) confluent, and (3) the sclerosing type. In the first two types a more or less acute process is often noted, with redness of the skin, fluctuation, sinus formation or ulceration. In the sclerosing type the lesion is firm and irregular and the breast is apt to be distorted. This type is more common in older women and is not infrequently mistaken for malignancy. Retraction of the nipple and pig-skin appearance of the skin may be seen in any of the three types. Clinically, the diagnosis is based upon the chronicity of the lesion, with a tendency to infiltration and softening.

It is difficult to understand how, except by direct innoculation, breast tissue should be primarily involved any more than should tissue such as bone. Some are of the opinion that the majority of cases are the result of retrograde lymphatic involvement from the axilla or from some intrathoracic focus. This opinion is based upon the observation that the lymphatic involvement in a number of cases definitely precedes the mammary involvement.

H. E. Simon, M.D.

CANCER OF THE UMBILICUS SECONDARY TO CANCER OF THE CECUM: Jerome R. Head (S. G. & O., 42, 3, p. 356). The author reports the case of a woman, age 65, who had been explored two years previously and an inoperable tumor of the cecum found. One year after the operation she had noticed a small pimple at the umbilicus, which bled when it was scratched. It had increased in size, and on admission was a raised, fungating mass 6 cm. in diameter.

On admission, the patient had an intestinal obstruction for which an ileostomy was performed. Microscopic exami-

ation of the tissue removed from the umbilical tumor owed it to be a typical adeno-carcinoma.

Most of the diseases of the umbilicus hark back to the eriod of intra-uterine existence and its termination. Until short time before birth it encompasses outpocketings of ie gastro-intestinal and genito-urinary tracts, and it is not ncommon for these to remain patent, or for portions of iem to become pinched off and persist as cell rests or ysts.

It also remains as a route of communication between the enous and the lymphatic systems of the peritoneal cavity nd the body surface.

Of the 101 cases of cancer of the umbilicus found in the terature, 25 were primary. In the other cases the growths ccurred secondary to the following primary sites, in order f frequency: stomach, ovary, intestines, gall-bladder, and terus.

The usual route of extension is by way of the lymphatics. he normal lymphatic flow is away from the navel, which oubtless accounts for the rarity of secondary cancer in his site. Occasionally the involvement is by direct exten- ion from the stomach or intestine, with the formation of fistula.

In secondary growths the symptoms are usually those f advanced cancer at the primary site. These symptoms re occasionally absent, so that in all cases of cancer of he umbilicus a most careful search should be made for a atent visceral focus.

H. E. Simon, M.D.

PEDIATRICS

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HYPERTHYROIDISM IN CHILDREN: Robert S. Dins- more (S. G. & O., Feb., 1926, vol. 42, 2, p. 172). The ncidence of hyperthyroidism in children is probably higher han would be supposed from the comparatively small num- ber of cases which have been reported in the literature. The author briefly reviews the cases reported in the litera- ur and reports 48 more, all under 14 years of age.

It is difficult to find a definite etiological factor in these ases. In the majority there has been no family history of goiter, of thyroid enlargement or of infection. Hyperthy- roidism may be induced by the use of iodine, but only in a very small percentage of cases. DeQuervain believes that he risk from iodine in these cases is almost nil if the dose loes not exceed 3 mgms.

The usual sequence of symptoms is nervousness followed by enlargement of the thyroid gland, with tachycardia and exophthalmos. Loss in weight is not a constant finding. The determination of the basal metabolism in children is rather unsatisfactory owing to divergence of opinion as to what may be considerd the normal rate and to the difficul- ties in controlling children.

The treatment of hyperthyroidism is the same whether the patients are children or adults except that it must be borne in mind that these children are very susceptible to every form of stimuli and are very poor operative risks. The same careful handling is required as in severe cases in adults.

In the presence of other foci of infection, the goiter should be removed first, as other operative procedures in the pres- ence of severe hyperthyroidism is apt to cause a very severe reaction.

H. E. Simon, M.D.

ROENTGENOLOGY

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ROENTGEN RAY STUDY OF BRONCHIECTASIS: Singer and Graham (Am. Jour. Roent., Vol. 15, p. 54, Jan., 1925). Roentgenograms are made in cases suspected of bronchiectasis in the antero-posterior, postero-anterior, and horizontal positions. An analysis of the shadows seen in these films, together with the history and physical signs, will usually permit a definite diagnosis to be made. Par- ticular attention should be given to the shadows in the cardio-phrenic angles which are often confused with the heart shadow.

Diagnostic pneumothorax, using a comparatively small amount of air, will give valuable information as to which lung is most diseased, and as to the extent of the bron- chiectasis. Frequently the pneumothorax thus instituted has such a beneficial effect that it is continued for thera- peutic purposes.

Postural drainage should be instituted. Its effects can best be studied by repeated roentgen examinations and the relative size of the bronchiectatic area can be determined.

The lobes affected are frequently atelectatic and this con- dition can be distinctly determined by *x*-ray examination before operation.

Leo G. Rigler, M.D.

FRACTIONAL ROENTGEN IRRADIATION: Morgan (Am. Jour. Roentgenol., Vol. 15:115, Feb., 1926). The use of very heavy doses of *x*-rays at one sitting has a number of objections, chief among which are the long time required which exhausts the patient and the profound deleterious effect which may be produced upon the normal tissues and the general resistance of the patient. In addition to the destruction of the abnormal cells, it is important, in giving radiation, to preserve the normal tissues which have no doubt an inhibitory power of their own against the abnor- mal cells.

The author has therefore changed his technic, using small doses at frequent intervals, three or four times a week. The

voltage and filtration remain the same. The portals of entry are increased greatly in size to attempt to reach any possible tumor tissue even at some distance. This type of radiation appears to be very effective especially in the inoperable cases of cancer in which the general condition of the patient is poor and radical treatment would be dangerous. Remarkable involutions of malignant growths, which previously had proved resistant to heavy radiation, are reported.

Leo G. Rigler, M.D.

PYELITIS IN PREGNANCY: Butler (Am. Jour. Roentgenol., 15:144, Feb., 1926). A study of the urinary tract by means of the injection method—the pyclogram—is very accurate. It demonstrates the presence of pathology and the extent of the lesion. In the pyelitis of pregnancy it can be done the same time that drainage and lavage—the method of treatment—are accomplished.

A study of cases of pyelitis in pregnancy reveals that it occurs most commonly in multiparas; it may be early or late and is most frequent on the right side. The diagnosis is first made by the finding of pus and colon bacilli in the urine. The treatment consists of plenty of water, rest, and lavage; catheterization of the ureters with drainage frequently clears up the condition.

The catheterization is usually accomplished without any great difficulty, although pressure on the bladder or ureters may cause some obstruction. Sodium iodide is injected and bilateral injections are made without hesitation. The remainder of the technic is of the usual type.

The cases may be divided into: (1) dilatation of the pelvis and ureter with or without kinks; (2) blunting of the calyces in addition to dilatation; (3) real destruction of kidney substance.

All these forms are clearly manifested in the pyelograms.

Leo G. Rigler, M.D.

EYE, EAR, NOSE AND THROAT

SUPERVISORS:

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THE VALUE OF THE ROENTGEN RAY IN RHINOLOGIC DIAGNOSIS, WITH AN ELABORATION OF THE OBLIQUE METHOD OF RHESE: W. P. Wherry, M.D. (Archives of Otolaryngology for Jan., 1926, p. 1). The oblique position of Rhese is designed to show to the best advantage the ethmoid and sphenoid sinuses in roentgenograms. It presents the sinuses in their anteroposterior dimensions, which allows a study of the separate cells and readily identifies the structures in question. Also, because the exposure is made through tissue of lesser density than ordinarily, the tissue changes, suppurative and non-suppurative, are more easily recognized. This is especially true in stereoscopic exposures.

The oblique method requires close accuracy in the placing of the patient and timing of the exposure. The entire region is seen through the orbit. Stereoscopic roentgenograms are essential to careful diagnosis.

Technic.—Use four 8 by 10 duplitized films which are placed with double intensifying screens mounted in cassettes. Use a 5-inch spark gap with 20 milliamperes, and a distance of 33 inches for the oblique position.

The oblique position is made with the patient prone, and the chest resting on a pillow. The head is placed so that the left side rests on the superior angle of the orbit, and the prominence of the left molar bone. The tip of the nose touches the plate changer and a five-eighth-inch block of wood is placed under the chin. Stereoscopic views are taken, the position is changed and the procedure repeated on the right side. The distance is 33 inches.

Comment.—The oblique method of Rhese affords the best comparative study of the ethmoid and sphenoid sinuses of any methods tried. Other methods show the sinus isolated or overlapped by other adjacent parts, and do not convey the comparative information necessary for proper orientation.

E. L. Armstrong, M.D.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

The Pharmacopeia of the United States of America. 10th Decennial Revision. Prepared by the Committee of Revision and published by the Board of Trustees. Cloth, $4.00. Philadelphia: J. B. Lippincott Co., 1926.

International Clinics. Edited by Henry W. Cattell, A.M., M.D., Philadelphia, in collaboration with others. Volume I. Thirty-sixth series, 1926. 309 pages. Illus. Philadelphia and London: J. B. Lippincott Co., 1926.

Ophthalmic Neuro-myology. C. G. Savage, M.D., LL.D., former Professor of Ophthalmology in the Medical Department, Vanderbilt University, etc. 2nd edition. 227 pages. Illus. Cloth, $3.00. Published by author, Nashville, Tenn., 1926.

Medical Diagnosis for the Student and Practitioner. Charles Lyman Greene, M.D., St. Paul, Formerly Professor of Medicine and Chief of Medical Clinic, University of Minnesota, Chief of Staff, St. Luke's Hospital, St. Paul, etc., etc. 1,495 pages. 14 color plates, 709 illustrations. 6th revised edition. Cloth, $12.00. Philadelphia: P. Blakiston's Son & Company, 1926.

PEDIATRICS—THE PRACTICAL MEDICAL SERIES. Vol. IV. Edited by Isaac A. Johanna Herrmann, M.D. 381 pages. Illus. Cloth, $2.00. Chicago: The Year Book Publishers, 1925.

This is a complete review of current Pediatric Literature for the year 1924. During this period considerable attention was paid to hemorrhagic conditions of the newborn and also to immunization of individuals to scarlet fever and diphtheria.

L. R. Critchfield, M.D.

HE DEVELOPMENT OF OUR KNOWLEDGE OF TUBERCULOSIS. Lawrence F. Flick, M.D., LL.D. Philadelphia. 783 pages. Cloth, $7.50. Published by the author, 738 Pine Street, Philadelphia, 1925.

"Tuberculosis is one of the most complex and most difult subjects in the art and science of medicine. It has en an affliction from the dawn of civilization. Now that is understood. and its mysteries cleared up, and the way ved for its extermination, the story of how this was done of gripping interest."

And this story loses none of its interest in the way it is ld in Dr. Flick's work, which is the result of a prodigious nount of historical research and labor.

He tells us of the apostems of the ancients and that they scussed the contagiousness of tuberculosis and its entity ith the pearl disease of cattle. He leads us along the aths of darkness through the middle ages with accounts their horrible decoctions to Morton's "Phthisiologia," hich was writetn in the seventeenth century. Thence e goes on step by step to Auenbrugger's discovery of ercussion, with accounts of the work of Stark, Reid and aillie in England and Scotland, of Portal, and finally of aennec in France. This chapter on Laennec, one of the eroes of medical history, dying at forty-six years of age om tuberculosis which probably was acquired while in ie post-mortem room, is intensely interesting. The father f physical examination as practised today, he devised the tethoscope, taught the value of auscultation and revived uenbrugger's methods of percussion—besides clearing up nany pathological questions by his keen observations and lear reasoning powers. And so the story goes on to Virhow, who taught in the '60s that tuberculosis, phthisis, crofula, and lupus were separate diseases and did not accept the identity of tuberculosis and the pearl disease of cattle, and believed tuberculosis to be inherited. At the same time Villemin was demonstrating most logically that tuberculosis was a communicable disease. Thus Koch's work is reached and all the uncertainties and wordy debates of the centuries are finally ended, a program based on scientific truths is clearly stated and the world is today demonstrating once more the truth of Pasteur's statement that it is within the power of man to banish every parasitic disease.

This is a monumental work and its study full of pleasure and instruction.

H. L. Taylor, M.D.

MAN: HIS MAKING AND UNMAKING. E. Boyd Barrett, M.A., Ph.D., Prof. of Psychology, Georgetown Univ., Washington, D. C. 269 pages. Cloth, $2.50. New York: Thomas Seltzer, 1925.

This work is a book of 269 pages, devoted to a simplified study of the so-called "new psychology." The author devotes himself to proving that man's unmaking is largely due to lack of self-knowledge, while man's making is founded upon a clear understanding of his own nature. He deals in a very interesting way with a general discussion of mankind, going into reactions and subconscious mental processes of the individual. Following this are interesting chapters on the mind out of tune, abnormal impulses, dromomania, kleptomania, pyromania, narcotomania, gambling, borrowing and criminal tendencies. Taking up each of these as a separate entity, he discusses them all in a simple, rational and fascinating way. It is a volume which is very interesting and useful to those who cannot satisfy themselves with mere Freudianism.

W. H. Hengstler, M.D.

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Minnesota State Medical Association Roster 1926

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Minnesota State Medical Association

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Regular meetings, last Monday in each month.
Annual meeting, last Monday in December.

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Martin and Faribault Counties.
Regular meeting, monthly.
Annual meeting, fourth Thursday in May.

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Best, F. E. ..... Wells
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CAMP RELEASE DISTRICT MEDICAL SOCIETY

Renville, Chippewa, Lac qui Parle, Yellow Medicine and Sibley Counties.
Regular meetings, quarterly.
Annual meeting, October.

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Holmberg, L. J. ..... Canby

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Aldrich, F. H. ..... Belview
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CENTRAL MINNESOTA DISTRICT MEDICAL SOCIETY

Mille Lacs, Sherburne, Isanti, Anoka and Kanabec Counties
Regular meeting, November.
Annual meeting, June.

President
Swenson, Charles ..... Braham
Secretary
Cooney, H. C. ..... Princeton

Bossert, C. S. ..... Mora
Caley, G. R. ..... Princeton
Cooney, H. C. ..... Princeton
Gates, C. E. ..... Anoka
Hall, E. L. ..... Princeton
Hendenstrom, L. H. .. Cambridge
Norrgard, H. T. ..... Milaca
Peterson, A. A. ..... Mora
Roadman, I. M. ..... Ponsford
Roehlke, A. B. ..... Elk River
Shulean, N. S. ..... Cambridge
Spurzem, R. J. ..... Anoka
Stocking, F. F. ..... Milaca
Swennes, O. S. ..... Wahkon
Swenson Charles ..... Braham
Vick, M. ..... Onamia
Vrooman, F. E. ..... St. Francis

CHISAGO-PINE COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday in January, May, August and November.
Annual meeting, second Tuesday in May.

President
Dredge, H. P. ..... Sandstone
Secretary
Kelsey, C. G. ..... Hinckley
Bohling, B. S. ..... Sandstone
Callahan, F. F. ..... Pokegama
Dredge, H. P. ..... Sandstone
Flom, A. O. ..... Chisago City
Gunz, A. W. ..... Center City
Holmes, A. E. ..... Rush City
Kelsey, C. G. ..... Hinckley
Paulson, C. W. ..... North Branch
Stephan, E. L. ..... Hinckley
Stewart, R. I. ..... Lindstrom
Stowe, A. J. ..... Rush City
Stratte, A. K. ..... Pine City
Tilton, A. J. ..... Alden
Wiseman, Robert L. ..... Pine City

CLAY-BECKER COUNTY MEDICAL SOCIETY

Regular meetings, second Thursday, January, April, July and October.
Annual meeting, October.

President
Humphrey, E. W. ..... Moorhead
Secretary
Heimark, J. H. ..... Moorhead
Archibald, F. M. ..... Mahnomen
Bergheim, M. C. ..... Hawley
Griffin, P. J. ..... Gary
Hagen, O. J. ..... Moorhead
Haight, G. G. ..... Audubon
Heimark, Jacob H. ..... Moorhead
Humphrey, E. W. ..... Moorhead
Larson, O. O. ..... Detroit
Bardee, Katherine .....
..... Northampton, Mass.
Rutledge, L. H. ..... Detroit
Simison, C. W. ..... Hawley
Thornby, H. J. ..... Moorhead
Thysell, F. A. ..... Moorhead

DODGE COUNTY MEDICAL SOCIETY

Regular meetings, third Wednesday in January, May and September.
Annual meeting, third Wednesday in September.

President
Smith, F. D.....Kasson
Secretary
Bigelow, C. E.....Dodge Center

Adams, Rollin T.....Mantorville
Belt, Wallace E....Dodge Center
Bigelow, Chas. E...Dodge Center
Clifford, Frank F..West Concord
Smith, Frank D.....Kasson
Way, Osman F.....Claremont

FREEBORN COUNTY MEDICAL SOCIETY

Regular meetings, quarterly.
Annual meeting, December.

President
Von Berg, J. P.....Albert Lea
Secretary
Gamble, J. W.....Albert Lea

Branham, D. S.....Albert Lea
Burns, H. D.....Albert Lea

Buttruff, C. R.....Freeborn
Calhoun, F. W.....Albert Lea
Folken, F. G.....Albert Lea
Freeman, J. P.....Glenville
Gamble, J. W.....Albert Lea
Gamble, P. M.....Albert Lea
Gullixson, A.....Albert Lea
Kamp, B. A.....Albert Lea
Kooiker, H. J.....Albert Lea
Nannestad, J. R.....Albert Lea
Palmer, C. F.....Albert Lea
Palmer, W. L.....Albert Lea
Schultz, J. A.....Albert Lea
Vollum, E. O.....Albert Lea
Von Berg, J. P.....Albert Lea

GOODHUE COUNTY MEDICAL SOCIETY

Annual meeting, first Tuesday in January.

President
Werner, N. L.....Red Wing
Secretary
Smith, M. W.....Red Wing

Aanes, A. M.....Red Wing
Anderson, J. V.....Red Wing

Anderson, S. H.....Red Wing
Backe, Edmund.....Kenyon
Bjorgo, C. W.....Cannon Falls
Claydon, L. E.....Red Wing
Conley, Alva.....Cannon Falls
Cremer, M. H.....Red Wing
Cremer, P. H.....Hastings
Gausemel, S. D.....Goodhue
Johnson, A. E.....Red Wing
Jones, A. W.....Red Wing
McGuigan, H. T.....Red Wing
Sawyer, H. P.....Goodhue
Smith, M. W.....Red Wing
Steffens, L. A.....Red Wing
Werner, N. L.....Red Wing

HENNEPIN COUNTY MEDICAL SOCIETY

Regular meetings, first Monday of each month, except July and August.
Annual meeting, first Monday in January.

President
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Secretary
LaVake, R. T.....Minneapolis

Abbott, A. W.....Minneapolis
Adair, Fred L.....Minneapolis
Ahrens, R. S.....Minneapolis
Allen, H. W.....Minneapolis
Allison, R. G.....Minneapolis
Almquist, H. E.....Minneapolis
Andersen, Arnt G....Minneapolis
Anderson, A. E.....Minneapolis
Anderson, David D...Minneapolis
Anderson, Ed. Dyer.Minneapolis
Anderson, Frank J...Minneapolis
Anderson, James K....Crookston
Annis, H. B.....Minneapolis
Arey, H. C.....Excelsior
Arvidson, C. G.....Minneapolis
Aune, Martin.....Minneapolis
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Avery, J. Fowler....Minneapolis
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Baker, Alfred T.....Minneapolis
Baker, E. L.....Minneapolis
Baker, Looe .....Minneapolis
Bakke, O. H.....Minneapolis
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Benn, F. G.....Minneapolis
Benson, Ross D.....Minneapolis
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Bessesen, Dan H.....Minneapolis
Bessesen, Wm. A.....Minneapolis
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Boreen, C. A.....Minneapolis
Bouman, H. A. H....Minneapolis
Boynton, Ruth E.....Minneapolis
Bracken, H. M.....Minneapolis
Bratrud, Arthur F...Minneapolis
Brooks, Chas. N.....Minneapolis
Brown, E. J.....Minneapolis
Brown, Edgar D.....Minneapolis

Brown, R. S.....Minneapolis
Bryant, Oliver R....Minneapolis
Butler, John.....Minneapolis
Byrnes, W. J.....Minneapolis
Cabot, V. S.....Minneapolis
Cady, L. H.....Minneapolis
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Campbell, Lowell M..Minneapolis
Campbell, Robert A..Minneapolis
Carey, James B.....Minneapolis
Carlaw, C. M.....Minneapolis
Cheleen, S. J.....Minneapolis
Cherry, Chas. H.....Minneapolis
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Cutts, George.....Minneapolis
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Dahl, Elmer O.....Minneapolis
Dahl, John A.....Minneapolis
Daniel, Donald H....Minneapolis
Daniel, Lewis M.....Minneapolis
Dart, L. O.....Minneapolis
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Deziel, G.....Minneapolis
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Strout, G. Elmer.....Minneapolis
Stuhr, Henry C.....Minneapolis
Sundt, Mathias .....Minneapolis
Swanson, Roy E.....Minneapolis
Sweetser, H. B., Sr...Minneapolis
Sweetser, H. B., Jr...Minneapolis
Sweetser, Theodore..Minneapolis
Sweitzer, S. E.....Minneapolis
Swendseen, Carl G...Minneapolis

Taft, John O.....Minneapolis
Taft, Walter L.....Minneapolis
Tanner, Alvin C.....Minneapolis
Taylor, Rood .....Minneapolis
Tennyson, Theo.....Minneapolis
Ternstrom, O. H.....Minneapolis
Thomas, Geo. E.....Minneapolis
Thomas, George H...Minneapolis
Thomas, Gilbert.....Minneapolis
Tingdale, A. C.....Minneapolis
Towers, F. E.....Minneapolis
Trueman, Harold S...Minneapolis
Tunstead, Hugh J...Minneapolis
Turnacliff, D. D.....Minneapolis
Tyrell, C. C.....Minneapolis

Ulrich, Henry L.....Minneapolis
Undine, Clyde A.....Minneapolis

Voyer, E. O.....Minneapolis

Waldron, Carl W....Minneapolis
Wanous, E. Z.....Minneapolis
Ward, A. W.....Minneapolis
Warham, Thos. T....Minneapolis
Watson, J. A.....Minneapolis
Webb, R. C.....Minneapolis
Weisman, Sam.....Minneapolis
Welles, H. J.....Minneapolis
Wethall, A. G.....Minneapolis
Weum, T. W.....Minneapolis
Whetstone, Mary S...Minneapolis
White, S. Marx.....Minneapolis
Widen, W. F.....Minneapolis
Wiese, H. F. B.....Minneapolis
Wilcox, Archa E.....Minneapolis
Wilcox, M. Russell..Minneapolis
Willcutt, Clarence...Minneapolis
Williams, Robert....Minneapolis
Willson, Hugh S.....Minneapolis
Witham, C. A.....Minneapolis
Wittich, F. W.....Minneapolis
Wohlrabe, A. A.....Minneapolis
Wood, Douglas F....Minneapolis
Woodard, F. R.....Minneapolis
Woodworth, Elizabeth .....
.....Minneapolis
Wright, Chas. B.....Minneapolis
Wright, C. D'a.....Minneapolis
Wright, Franklin R. Minneapolis
Wynne, H. M. N.....Minneapolis

Yoerg, O. W.....Minneapolis

Zaworski, Edw. A....Minneapolis
Ziskin, Thos.....Minneapolis

HOUSTON-FILLMORE COUNTY MEDICAL SOCIETY

Regular meetings, May, August and October.
Annual meeting, October.

President
by, Cyrus B.....Spring Valley
Secretary
ischer, O. F.....Houston

nderson, Norman E...Harmony
rowning, W. E.....Caledonia
hristianson, H. W.....Wykoff
lifton, Theo. A.....Chatfield
avis, I. Grant.....Rushford

Drake, F. A.....Lanesboro
Eby, Cyrus B.....Spring Valley
Fischer, O. F.....Houston
Grinnell, W. B.....Preston
Helland, G. M.....Spring Grove
Helland, J. W.....Spring Grove
Kibbe, O. A.....Canton
Kierland, P. E.....Alexandria
Lannin, J. C.....Mabel
Nass, H. A.....Mabel

Nelson, M. S.....Granite Falls
Onsgard, C. K.....Halstad
Onsgard, L. K.....Houston
Rhines, D. C.....Caledonia
Sather, E. R.....Alexandria
Tierney, C. M.....Granger
Utley, J. O.....Montrose
Williams, R. V.....Rushford
Wilson, R. H.....Rushford
Woodruff, C. W.....Chatfield

KANDIYOHI-SWIFT COUNTY MEDICAL SOCIETY

Regular meetings, quarterly, as called by the President.
Annual meeting, December.

President
rench, H. S.....New London
Secretary
cofield, C. L.....Benson

ranton, A. F.....Willmar

Branton, B. J.....Willmar
Daignault, O.....Benson
Davison, P. C.....Willmar
Dowswell, W. J.....Benson
Fiksdal, M. J.....Willmar
French, H. S.....New London
Frost, E. H.....Willmar

Hodapp, J. R.....Willmar
Jacobs, John C.....Willmar
Johnson, Hans .....Kerkhoven
Kaufman, Wm.....Appleton
Little, D. W.....Appleton
Rains, John M.....Willmar
Scofield, C. L.....Benson

LYON-LINCOLN COUNTY MEDICAL SOCIETY

Regular meetings, May and July.
Annual meeting, October.

President
ord, B. C.....Marshall
Secretary
Vorkman, H. M.....Tracy

kester, Ward .....Marshall
Bossingham, O. N...Lake Benton
horest, J. C. R.....Marshall

Engh, Sigfred .....Cottonwood
Ford, Burton C.....Marshall
Germo, Chas.....Balaton
Gray, F. D.....Marshall
Hoidale, A. D.....Tracy
Jacquot, G. L.....Tyler
Jensen, J. C.....Hendricks
Pearson, W. T.....Russell

Persons, C. E.....Marshall
Robertson, J. B.....Cottonwood
Sanderson, E. T.....Minneota
Thordarson, Theo.....Minneota
Vadheim, A. L.....Tyler
Valentine, W. H.....Tracy
Workman, H. M.....Tracy
Workman, W. G.....Tracy

McLEOD COUNTY MEDICAL SOCIETY

Regular meetings, April and July.
Annual meeting, April.

President
chmidt, W. R.....Glencoe
Secretary
xilrod, D. L.....Hutchinson

xilrod, D. L.....Hutchinson

Clair, J. B.....Winsted
Clement, J. B.....Lester Prairie
Crow, E. R.....Minneapolis
Holm, H. H.....Glencoe
Klima, W. W.....Stewart
Kohler, F. G.....Minneapolis
Langhoff, A. H.....Glencoe

Saar, W. G.....Hutchinson
Schmidt, W. R.....Glencoe
Scholpp, O. W.....Hutchinson
Sheppard, Fred .....Hutchinson
Sheppard, P. E.....Hutchinson
Trutna, Thos. J.....Silver Lake

MEEKER COUNTY MEDICAL SOCIETY

Regular meetings, quarterly, May 15, August 15, October 15.
Annual meeting, December 15.

President
Brigham, Frank .....Watkins
Secretary
Danielson, K. A.....Litchfield

Brigham, Frank.....Watkins
Cutts, G. A. C.....Litchfield
Danielson, K. A.....Litchfield
Dulude, S. .....Dassel

Lyman, F. V.....Grove City
Peterson, Alfred.....Dassel
Sturre, J. R.....Watkins
Wilmot, H. E.....Litchfield

MOWER COUNTY MEDICAL SOCIETY

Regular meetings, last Thursday of every month.
Annual meeting, last Thursday of November.

President
Lommen, P. A.....Austin
Secretary
Allen, Chas. C.....Austin

Allen, A. W.....Austin
Allen, C. C.....Austin
Baldwin, A. E.....Brownsdale
Cobb, Willis F.....Lyle

Coleman, F. B.....Lyle
Grise, W. B.....Austin
Hegge, C. A.....Austin
Hegge, O. H.....Austin
Henslin, A. E.....Le Roy
Hertel, G. E.....Austin
Leck, C. C.....Austin
Lommen, P. A.....Austin
McKenna, J. K.....Austin

Melzer, G. R.....Lyle
Mitchell, R. S.....Austin
Morrow, J. J.....Grand Meadow
Morse, M. P.....Le Roy
Robertson, Paul A.....Austin
Schottler, G. J.....Dexter
Torkelson, P. T.....Lyle
Warren, C. L.....Le Roy

NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

Regular meetings, June, September and December.
Annual meeting, December.

President
Smith, B. F.....St. Peter
Secretary
Daniels, J. W.....St. Peter

Aitkens, H. B...Le Sueur Center
Baskett, Geo. T.....St. Peter

Baskett, Olive T.....St. Peter
Behmler, Fred W.....Appleton
Covell, W. W.....St. Peter
Daniels, J. W.....St. Peter
Dodge, F. A.....Le Sueur
Eirley, Clara G..Mt. Pleasant, Ia.
Ericson, S.....Le Sueur
Fisher, J. M.....St. Peter

Freeman, Geo. H.....St. Peter
Le Clerc, J. E.....Le Sueur
McKeon, J. O.....Montgomery
Meilicke, W. A.....Nicollet
Norris, J. F.....St. Peter
Smith, B. F.....St. Peter
Strathern, F. P.....St. Peter

OLMSTED COUNTY MEDICAL SOCIETY

Regular meetings, second Wednesday in April, June, September and December.
Annual meeting, second Wednesday in December.

President
Pollock, L. W.....Rochester

Secretary
Piper, M. C.....Rochester

Adams, S. Franklin....Rochester
Adson, Alfred W.....Rochester
Allen, Roy W.....Rochester
Allen, Wilson A.....Rochester
Amberg, Samuel.....Rochester
Anderson, C. M.....Rochester
Anderson, E. W.....Rochester
Anderson, Mark J.....Rochester
Asbury, J. T.....Rochester
Ash, Wilfrid A.....Rochester
Aurelius, J. Richards..Rochester
Balch, Franklin G.....Rochester
Balfour, Donald C.....Rochester
Barborka, C. J.....Rochester
Bargen, J. Arnold.....Rochester
Beach, Watson .....Rochester
Barnes, A. R.....Rochester
Becker, Samuel W.....Rochester
Benedict, W. L.....Rochester
Bergen, Ralph D.....Rochester
Berkman, David M.....Rochester
Bliss, John H.....Rochester
Blackford, Launcelot M.....
.....Rochester
Bonta, Maurice B.....Rochester
Boothby, Walter M.....Rochester
Borgeson, Egbert J....Rochester
Bowing, Harry H.....Rochester
Bowles, John H.....Rochester
Braasch, W. F.....Rochester
Brading, Edward T....Rochester
Broders, A. C.....Rochester
Brown, A. E.....Rochester
Brown, George E.....Rochester
Brown, Philip W.....Rochester
Bueerman, Winifred H.....
.....Rochester
Buie, Louis A.....Rochester
Bumpus, Hermon C....Rochester
Burns, Arthur.....Rochester
Carman, Russell D.....Rochester
Cathcart, Edward P...Rochester
Caylor, Harold D.....Rochester
Chumley, Charles L....Rochester
Coffey, Jay R.....Rochester
Collins, Harry R.....Rochester
Comfort, Mandred W..Rochester
Conner, Harry M.....Rochester
Constans, George M....Rochester
Counseller, Virgil S...Rochester
Craig, W. McK.....Rochester
Crane, William W., Jr..Rochester
Crenshaw, John L.....Rochester
Crewe, John E.....Rochester
Culligan, Leo C.....Rochester
Daly, Joseph .....Rochester
Davis, Austin C.....Rochester
Desjardins, Arthur U..Rochester
Dixon, Claud F.....Rochester
Dixon, Robt. .....Rochester
Dobson, Herbert V.....Rochester
Dolder, Felix C.....Eyota
Doyle, John.....Rochester
Drips, Della G.....Rochester
Dunlap, Harold F.....Rochester
Eskew, Don Carlos....Rochester
Eusterman, George B..Rochester
Evarts, Arrah.....Rochester
Faust, Louis S.....Rochester
Fawcett, C. E.....Stewartville
Figi, Frederick A.....Rochester
Finney, W. P.....Rochester
Fishback, Frederick C. Rochester
Flothow, Paul G.....Rochester
Ford, Frances A.....Rochester
Forsberg, Carl W.....Rochester
Gaarde, Fred W.....Rochester
Garvin, John D.....Rochester
Gay, James G.....Rochester
Giffin, H. Z.....Rochester
Gipner, John F.....Rochester
Goeckerman, W. H.....Rochester
Greene, Carl H.....Rochester
Greene, Earl I.....Rochester
Greenlee, Daniel P.....Rochester
Grob, Otto.....Rochester
Habein, Harold C.....Rochester
Haines, Samuel F.....Rochester
Hallberg, C. A.....Rochester
Hallenbeck, Dorr F....Rochester
Hamrick, Robert A....Rochester
Hand, John R.....Rochester
Hargis, Estes H.....Rochester
Harrington, Ethel R...Rochester
Harrington, S. W.....Rochester
Harshbarger, I. L.....Rochester
Hartman, Howard R...Rochester
Heetderks, Dewey R...Rochester
Helmholz, Henry F....Rochester
Hempstead, Bert E.....Rochester
Hench, Philip S.....Rochester
Henderson, Earl F.....Rochester
Henderson, Melvin S...Rochester
Hendricks, William A..Rochester
Heyerdale, Oscar C....Rochester
Holloway, Jackson K..Rochester
Horton, Bayard T.....Rochester
Horwitz, Alec.....Rochester
Hufford, Alvin R.....Rochester
Huffman, Lester D.....Rochester
Hunt, India.....Rochester
Hunt, Verne C.....Rochester
Jacobs, Minerd F.....Rochester
Jepson, Paul N.....Rochester
Johnson, Arthur C.....Rochester
Johnson, Henry P.....Rochester
Jones, Hugh T.....Rochester
Joyce, George T.....Rochester
Judd, Edward S.....Rochester
Keith, Norman M.....Rochester
Kennedy, Roger L. J..Rochester
Kernohan, James W...Rochester
Kilfoy, Edward J.....Rochester
Killins, Wendell A.....Rochester
Kirchner, Augustus ...Rochester
Lapp, Victor R.....Rochester
Latchford, James K...Rochester
Lemon, Willis S.....Rochester
Lillie, Harold I.....Rochester
Lillie, Walter I.....Rochester
Linton, William B.....Rochester
Lindsey, Maude L.....Rochester
Logan, A. H.....Rochester
Luden, Georgine.....Rochester
Lundy, John S.....Rochester
Lyday, Russell O.....Rochester
Magath, Thomas B....Rochester
Mahle, Arthur E.....Rochester
Marsh, Fred E.....Rochester
Masson, Duncan M.....Rochester
Masson, James C.....Rochester
Mayfield, A. L.....Rochester
Mayo, Charles H.....Rochester
Mayo, William J.....Rochester
Maytum, Charles K...Rochester
McKaig, Carle B.....Pine Island
McKeithen, A. M.....Rochester
McKnight, Roy B.....Rochester
McQuiggan, Mark R...Rochester
McVicar, Charles S....Rochester
Mentzer, Stanley H....Rochester
Meyerding, Henry W...Rochester
Moersch, Fred P.....Rochester
Moersch, Herman J....Rochester
Moore, A. B.....Rochester
Montgomery, Hamilton.Rochester
Morton, Charles B.....Rochester
Muhme, Norman B.....Rochester
Mussey, Robert D.....Rochester
Nagel, G. W.....Rochester
Nelson, M. O.....Rochester
New, Gordon B.....Rochester
Nickel, Allen A. C....Rochester
Nixon, Samuel H.....Rochester
Ochsenhirt, Norman C..Rochester
Offutt, Susan R.....Rochester
Ohlinger, Lorin B.....Rochester
Olson, Ernest A.....Pine Island
O'Leary, Paul A.....Rochester
Omohundro, Miles P...Rochester
Parker, Bennett R.....Rochester
Parker, Harry L.....Rochester
Parker, J. William....Rochester
Parker, Stephen T.....Rochester
Pemberton, John deJ..Rochester
Piper, Monte C.....Rochester
Plankers, A. G.....Rochester
Plummer, Henry S.....Rochester
Plummer, W. A.....Rochester
Pollock, Lee W.....Rochester
Powell, Lester D.....Rochester
Prangen, Avery.....Rochester
Prickman, Louis E.....Rochester
Pugliese, Frank M.....Rochester
Randall, Lawrence M..Rochester
Reid, J. Spence.....Rochester
Rivers, A. B.....Rochester
Robertson, H. E.....Rochester
Rohwer, C. J.....Rochester
Rosenow, Edward C..Rochester
Rowntree, Leonard G..Rochester
Sager, William W.....Rochester
Sanford, Arthur H.....Rochester
Schmitt, Earl O. G.....Rochester
Schulz, Irwin.....Rochester
Shafter, Royce R.....Rochester
Shelden, Walter D.....Rochester
Shippey, Stuart H.....Rochester
Simon, Harold E.....Rochester
Sistrunk, Walter E.....Rochester
Smith, F. L.....Rochester
Smith, Newton D.....Rochester
Snell, Albert M.....Rochester
Stacy, Leda J.....Rochester
Stark, W. B.....Rochester
Stinson, John W.....Rochester
Stuhler, Louis G.....Rochester
Sutherland, C. G.....Rochester
Swan, T. S.....Rochester
Synhorst, A. P.....Rochester
Thompson, John W....Rochester
Vinson, Porter P.....Rochester
von Lackum, W. H....Rochester
Wagener, Henry P.....Rochester
Walters, Waltman.....Rochester
Webber, I. M.....Rochester
Weir, James F.....Rochester
Whitten, Merritt B....Rochester
Wilder, Russell M.....Rochester
Williamson, C. S.....Rochester
Wilkinson, H. F.....Rochester
Willius, F. A.....Rochester
Wilson, Louis B.....Rochester
Woltman, Henry W....Rochester
Yoakem, Howard H....Rochester

PARK REGION DISTRICT MEDICAL SOCIETY

Ottertail, Douglas, Grant and Wilkin Counties.
Regular meetings, second Wednesday in January, April, July and October.
Annual meeting, second Wednesday in October.

President
Cowing, P. G.....Evansville

Secretary
Satersmoen, Theo..Pelican Rapids

Baker, A. C.....Fergus Falls
Boysen, P.....Pelican Rapids
Brabec, F. J.....Perham
Broker, W. S.....Battle Lake
Burnap, W. L.....Fergus Falls
Cowing, P. G.....Evansville
Drought, W. W.....Fergus Falls
Esser, John .....Perham
Estrem, C. O.....Fergus Falls
Freeborn, J. A.....Fergus Falls
Goodson, Catherine M.....
.....Retreat, Pa.
Hand, W. R.....Elbow Lake
Haugen, G. T.....Fergus Falls
Kittelson, Theo. N..Fergus Falls
Lee, W. A.....Fergus Falls
Lewis, A. J.....Henning
Liebold, H. H....Parkers Prairie
Love, Fred A.....Carlos
Meckstroth, C. N.....Brandon
Naegeli, Frank.....Fergus Falls
Nelson, O. N.....Battle Lake
Otto, H. C.....Frazee
Parson, L. R.....Elbow Lake
Patterson, W. L....Fergus Falls
Paulson, Theo. S....Fergus Falls
Powers, F. W.....Barrett
Reeve, E. T.....Elbow Lake
Sargeant, H. L.....Fergus Falls
Satersmoen, Theo..Pelican Rapids
Sherping, O. Th.....Fergus Falls
Tanquist, E.....Alexandria
Vail, J. B.....Henning
Vigen, J. G.....Fergus Falls
Wray, W. E.....Campbell

RAMSEY COUNTY MEDICAL SOCIETY

Regular meetings, last Monday of each month except June, July and August.
Annual meeting last Monday in January.

President
Chatterton, C. C.....St. Paul

Secretary
Schulze, A. G.....St. Paul

Abbott, J. S.....St. Paul
Abramovich, J. H.....St. Paul
Ahrens, A. E.....St. Paul
Ahrens, A. H.....St. Paul
Alberts, Max W.....St. Paul
Alden, J. F.....St. Paul
Aldes, Harry.....St. Paul
Alexander, F. H.....St. Paul
Allen, Mason.....St. Paul
Anderson, W. T.....St. Paul
Armstrong, J. M.....St. Paul
Arnquist, A. S.....St. Paul
Arouni, Khalil.....St. Paul
Arzt, C. P.....St. Paul
Bacon, Donald K.....St. Paul
Bacon, L. C.....St. Paul
Balcome, F. E.....St. Paul
Ball, C. R.....St. Paul
Barry, L. W.....St. Paul
Barsness, Nellie.....St. Paul
Beadie, W. D.....Cannon Falls
Beals, Hugh.....St. Paul
Bell, C. C.....St. Paul
Benepe, L. M.....St. Paul
Bennion, P. H.....St. Paul
Bentley, Norman P.....St. Paul
Berrisford, Paul D.....St. Paul
Binger, H. E.....St. Paul
Birnberg, T. L.....St. Paul
Bock, R. A.....St. Paul
Boeckmann, Eduard ....St. Paul
Boeckmann, Egil.....St. Paul
Bohland, E. H.....St. Paul
Bole, R. S.....St. Paul
Bolstad, H. C.....St. Paul
Borg, Joseph F.....St. Paul
Bouma, L. R.....St. Paul
Brand, G. D.....St. Paul
Bray, E. R.....St. Paul
Brimhall, J. B.....St. Paul
Brodie, Walter D.....St. Paul
Brooks, D. F.....St. Paul
Brooks, G. F.....St. Paul
Brown, Edw. I.....St. Paul
Brown, John C.....St. Paul
Burch, F. E.....St. Paul
Burfiend, G. H.....St. Paul
Burns, F. W.....St. Paul
Burns, R. M.....St. Paul
Buscher, H.....St. Paul
Caldwell, David K.....St. Paul
Caldwell, Jas. P.....St. Paul
Caldwell, Kenneth S.....St. Paul
Cameron, J. A.....St. Paul
Campbell, J. E.....S. St. Paul
Cannon, Harry.....St. Paul
Carman, Paul I.....St. Paul
Carroll, Wm. C.....St. Paul
Carter, Fred C.....St. Paul
Cavanaugh, J. O.....St. Paul
Chandler, O. B.....St. Paul
Chatterton, C. C.....St. Paul
Christiansen, A.....St. Paul
Christison, J. T.....St. Paul
Clark, T. C.....
..Soldiers Home, Minneapolis
Cobb, S. G.....St. Paul
Colby, Woodard.....St. Paul
Cole, Wallace.....St. Paul
Collie, H. G.....St. Paul
Colvin, A. R.....St. Paul
Comstock, A. E.....St. Paul
Conner, Wm. H.....St. Paul
Connor, C. E.....St. Paul
Cook, Paul B.....St. Paul
Countryman, Roger S....St. Paul
Cowern, E. W.....N. St. Paul
Critchfield, L. R.....St. Paul
Crump, J. W.....St. Paul
Culligan, John M.....St. Paul
Dack, L. G.....St. Paul
Darling, J. B.....St. Paul
Daugherty, E. B.....St. Paul
Daugherty, L. E.....St. Paul
Davis, Herbert.....St. Paul
Davis, William.....St. Paul
Dedolph, K.....St. Paul
Dickson, Thos. H., Jr....St. Paul
Dittman, Geo. C.....St. Paul
Dohm, A. J.....St. Paul
Donohue, P. F.....St. Paul
Drake, Carl B.....St. Paul
Dunn, J. N.....St. Paul
Dunne, G. P.....St. Paul
Earl, Geo. A.....St. Paul
Earl, Robert O.....St. Paul
Edlund, G.....St. Paul
Ely, O. S.....S. St. Paul
Endress, E. K.....St. Paul
Engberg, E. J.....St. Paul
Ernest, G. C.....St. Paul
Eshelby, E. C.....St. Paul
Fahey, E. W.....St. Paul
Ferguson, J. C.....St. Paul
Fesler, Harold H.....St. Paul
Flagstad, A. E.....St. Paul
Fogarty, C. W.....St. Paul
Foley, F. E. B.....St. Paul
Freeman, C. D.....St. Paul
Fulton, J. F.....St. Paul
Gager, E. C.....St. Paul
Gardiner, D. G.....St. Paul
Geer, Everett K.....St. Paul
Geissinger, John D.....St. Paul
Geist, Geo. A.....St. Paul
Ghent, Harry.....St. Paul
Ghent, M. M.....St. Paul
Giere, E. O.....St. Paul
Gilfillan, J. S.....St. Paul
Ginsberg, Wm.....St. Paul
Goltz, E. V.....St. Paul
Grant, H. W.....St. Paul
Gratzek, Thos.....St. Paul
Greene, C. L.....St. Paul
Gruenhagen, Arnold P...St. Paul
Hagaman, Geo. K.....St. Paul
Hall, A. R.....St. Paul
Halper, P. A.....St. Paul
Hammes, E. M.....St. Paul
Hammond, J. F.....St. Paul
Harmon, G. E.....St. Paul
Hauser, Victor.....St. Paul
Hawkins, V. J.....St. Paul
Heath, A. C.....St. Paul
Hengstler, W. H.....St. Paul
Hensel, C. N.....St. Paul
Hesselgrave, S. S.....St. Paul
Hilger, A. W.....St. Paul
Hilger, D. D.....St. Paul
Hilger, L. A.....St. Paul
Hochfilzer, J. J.....St. Paul
Hoff, Alfred.....St. Paul
Hoff, Peder A.....St. Paul
Hoffman, Max H.....St. Paul
Holcomb, J. T.....St. Paul
Holcomb, O. W.....St. Paul
Holl, P. M.....Minneapolis
Howard, M. A.....St. Paul
Howard, W. S.....St. Paul
Hultkrans, Joel C.....St. Paul
Hunt, H. E.....St. Paul
Ide, Arthur W.....St. Paul
Ingerson, C. A.....St. Paul
Jesion, J. W.....St. Paul
Johnson, Asa M.....St. Paul
Johnson, Hartland C....St. Paul
Johnson, Ray G.....St. Paul
Johnson, T. H.....St. Paul
Jones, D. C.....St. Paul
Jones, E. M.....St. Paul
Kamman, Gordon R.....St. Paul
Kannary, E. L.....St. Paul
Kelly, John V.....St. Paul
Kelly, Paul H.....St. Paul
Kennedy, William.....St. Paul
Kenny, H. F.....St. Paul
Kesting, Herman.....St. Paul
King, Z. P.....St. Paul
Kistler, A. S.....St. Paul
Klein, H. N.....St. Paul
Knauff, M. K.....St. Paul
Kvitrud, G.....St. Paul
Langenderfer, F. V.....St. Paul
Larsen, C. L.....St. Paul
Larson, M. L.....St. Paul
Lax, Morris H.....St. Paul
Leahy, B.....St. Paul
Leavenworth, R. O.....St. Paul
Leitch, Archibald.....St. Paul
Lepak, John A.....St. Paul
Lerche, William.....St. Paul
Lewis, J. B.....S. St. Paul
Lewis, W. W.....St. Paul
Lick, C. L.....St. Paul
Little, W. J.....St. Paul
Lowe, Earl R.....St. Paul
Lundholm, A. M.....St. Paul
McBeath, Ewing.....St. Paul
McCarthy, W. R.....St. Paul
McClanahan, J. H....White Bear
McClanahan, T. S.....White Bear
McCloud, C. N.....St. Paul
McDavitt, Thomas.....St. Paul
McKeon, Owen.....St. Paul
McLaren, Jennette M....St. Paul
McNevin, C. F.....St. Paul
Maloney, T. J.....St. Paul
Martineau, J. L.....St. Paul
Meyerding, E. A.....St. Paul
Mitchell, Frederick.....St. Paul
Mogilner, S. N.....St. Paul
Molander, H. A.....St. Paul
Morris, R. Edwin.....St. Paul
Morrissey, F. B.....St. Paul
Mortenson, N. G.....St. Paul
Moskovitz, Selic.....St. Paul
Moss, Myer N.....St. Paul
Moynihan, T. J.....St. Paul
Muller, R. Theo.....St. Paul
Murphy, E. F.....St. Paul
Myers, Thos.....St. Paul
Neher, F. H.....St. Paul
Nelson, L. A.....St. Paul
Nesbit, Harold T.....St. Paul
Nichols, A. E.....St. Paul
Nippert, H. T.....St. Paul
Norris, E. H.....St. Paul
Nye, Katherine A.....St. Paul
Nye, Lillian.....St. Paul
O'Brien, H. J.....St. Paul
O'Connor, I. A.....St. Paul
O'Connor, J. P.....St. Paul
Oerting, Harry.....St. Paul
Ogden, Warner.....St. Paul
Ohage, Justus.....St. Paul
Ohage, Justus, Jr.....St. Paul
Olson, Chas. A.....St. Paul
Ostergren, E. W.....St. Paul
Pearson, F. R.....St. Paul
Pedersen, A. H.....St. Paul
Perry, C. G.....St. Paul
Peterson, V. N.....St. Paul
Plondke, F. J.....St. Paul
Ramsey, W. R.....St. Paul
Richards, E. T. F.....St. Paul
Richardson, H. E.....St. Paul
Riggs, C. Eugene.....St. Paul
Ritchie, H. P.....St. Paul
Rogers, John T.....St. Paul
Rosenthal, Robert.....St. Paul
Rothrock, J. L.....St. Paul
Rothschild, H. J.....St. Paul
Roy, Philemon.....St. Paul
Ruhberg, Geo. N.....St. Paul
Russell, Herman.....St. Paul
Rutherford, W. C.....St. Paul
Ryan, John J.....St. Paul
Ryan, Mark E.....St. Paul
Satterlund, V. L.....St. Paul
Savage, F. J.....St. Paul
Schoch, R. B.....St. Paul
Schons, E.....St. Paul
Schuldt, F. C.....St. Paul
Schulze, Albert G.....St. Paul
Schwyzer, Arnold.....St. Paul
Senkler, G. E.....St. Paul
Shannan, W. R.....St. Paul
Shapere, A. D.....St. Paul
Shellman, John L.....St. Paul
Shillington, M. A.....St. Paul
Shimonek, Anton.....St. Paul
Simon, B. F.....St. Paul
Simon, Geo. H.....St. Paul
Skinner, H. O.....St. Paul
Snyder, Geo. W.....St. Paul
Sohlberg, Olof.....St. Paul
Sprafka, J. M.....St. Paul
Staley, J. C.....St. Paul
Sterner, E. G.....St. Paul
Sterner, O. W.....St. Paul
Stevens, F. A.....Lake Elmo
Stewart, Alexander.....St. Paul
Stierle, Adolph.....St. Paul
Stinnette, S. E.....St. Paul
Stolpestad, H. L.....St. Paul
Swanson, Edwin O.....St. Paul
Swanson, John A.....St. Paul
Sweeney, Arthur.....St. Paul
Swendson, J. J.....St. Paul
Taylor, H. L.....St. Paul
Teisberg, C. B.....St. Paul
Tiber, L. J.....St. Paul
Tregilgas, H. R.....St. Paul
Tuttle, Thos. D.....St. Paul
Van Slyke, Chas. A.....St. Paul

Von der Weyer, William.St. Paul
Waas, Chas.....St. Paul
Wald, R. H.....St. Paul
Walker, R. E.....St. Paul
Wallinga, John H.....St. Paul
Walters, B. Frank.....St. Paul
Warner, E. F.....St. Paul
Warnock, R. W.....St. Paul
Warren, E. L.....St. Paul
Warwick, Margaret.....St. Paul
Welch, M. C.....St. Paul
Wheeler, M. W.....St. Paul
Whitacre, J. C.....St. Paul
Whitcomb, Ed. H.....St. Paul
White, J. S.....St. Paul
Whitmore, F. W.....St. Paul
Whitney, A. W.....St. Paul
Williams, Clayton.....St. Paul
Winnick, J. B.....St. Paul
Wold, K. C.....St. Paul
Wolfe, H. H.....St. Paul
Wood, H. G.....St. Paul
Yllvisaker, L. S.....St. Paul
Zander, C. H.....St. Paul
Zimmerman, H. B.....St. Paul

RED RIVER VALLEY MEDICAL SOCIETY

Kittson, Marshall, Polk, Roseau, Pennington, Red Lake, Norman and Mahnomen Counties.

Regular meetings, second Tuesday in April, September and December.

Annual meeting, December.

President
Dunlop, A. H.....Crookston
Secretary
Oppegaard, M. O.....Crookston

Adkins, C. M.....Grygla
Ahlfs, J. J.....Erskine
Anderson, W. S.....Minneapolis
Bernard, B. C...Thief River Falls
Bertelson, O. L.....Crookston
Biedermann, Jacob .....
.....Thief River Falls
Blegen, H. M.....Warren
Borreson, Baldwin.....Remer
Bowers, J. T...Thief River Falls
Bratrud, O. Edw.....Warren
Bratrud, Theo.....Warren
Brown, Lyle L.....Crookston
Daniels, W. H.....Crookston
Delmore, J. L.....Roseau
Dryden, F. M.....Crookston
Dunlop, Alex.....Crookston
Froelich, H. W..Thief River Falls
Henney, Wm. H.....McIntosh
Hodgson, H. H.....Crookston
Holmes, W. B.....Ada
Holte, Halvor.....Crookston
Kahala, Arthur.....Crookston
Kirk, G. P.....East Grand Forks
Kjelland, J. S.....
.....East Ellsworth, Wis.
Larson, A. L.....Fertile
Docken, O. E.....Crookston
Milan, M. Geo.....Warren
Morley, G. A.....Crookston
Nelson, H. E.....Crookston
Norman, J. F.....Crookston
Ohnstad, J.....McIntosh
Oppegaard, C. L.....Crookston
Oppegaard, M. O.....Crookston
Overend, K. V.....Hallock
Risjord, J. N.....Fertile
Roy, J. A.....Red Lake Falls
Sather, Allen.....Fosston
Shaleen, A. W.....Hallock
Shedlov, A.....Gully
Shelland, J. T.....Ada
Swedenberg, A. W.....
.....Thief River Falls
Turnbull, Robert .....Fosston
Watson, N. M.....Red Lake Falls
Wattam, G. S.....Warren
Werner, O. S.....St. Hilaire
Wiltrout, I. Geo.....Oslo

REDWOOD-BROWN COUNTY MEDICAL SOCIETY

Regular meeting, June 15.

Annual meeting, June 15.

President
Hammermeister, Theo. F....
.....New Ulm
Secretary
Meierding, Wm. A....Springfield

Adams, J. L.....Morgan
Dubbe, F. H.....New Ulm
Eckstein, A. W.....Comfrey
Fritsche, A.....New Ulm
Fritsche, L. A.....New Ulm
Hammermeister, Theo. F....
.....New Ulm
Jamieson, Earl....Walnut Grove
Kiefer, M. A.....Sleepy Eye
Meierding, Wm. A....Springfield
Pederson, O. J.....Hanska
Peterson, R. A.....Vesta
Reinecke, George F.....New Ulm
Rothenburg, J. C.....Springfield
Schoch, J. L.....New Ulm
Seifert, Otto J.....New Ulm
Shrader, J. S.....Springfield
Strickler, A. F.....Sleepy Eye
Strickler, Mary.....Sleepy Eye
Strickler, O. C.....New Ulm
Vogel, Jos. H.....New Ulm
Vogtel, M. A.....Minneapolis
Weiser, Geo. B.....New Ulm
Wellcome, J. W. B....Sleepy Eye

RICE COUNTY MEDICAL SOCIETY

Regular meetings quarterly, as called.

Annual meeting, December.

President
Moses, Joseph, Jr.....Northfield
Secretary
Traeger, C. A.....Faribault

Babcock, F. M.....Northfield
Beede, Ethel.....Faribault
Davis, F. U.....Faribault
Haessly, S. B.....Faribault
Hanson, A. M.....Faribault
Huxley, F. R.....Faribault
Kanne, C. W.....Faribault
Lee, W. P.....Northfield
Lexa, F. J.....Lonsdale
McBroom, D. E.....Faribault
Mayland, M. L.....Faribault
Meyer, P. F.....Faribault
Moses, Joseph, Jr.....Northfield
Plonske, C. J.....Faribault
Robilliard, C. M.....Faribault
Robilliard, W. H.....Faribault
Rumpf, C. W.....Faribault
Rumpf, W. H.....Faribault
Smith, P. A.....Faribault
Traeger, C. A.....Faribault
Warren, F. S.....Faribault
Warren, J. W.....Faribault
Wilson, Warren.....Northfield
Wilson, W. E.....Northfield

ST. LOUIS COUNTY MEDICAL SOCIETY

Regular meetings, second Thursday of month.

Annual meeting, October.

President
Barney, L. A.....Duluth
Secretary
Lepak, F. J.....Duluth

Abbott, Wm. P.....Duluth
Adams, B. S.....Hibbing
Arminen, K. V.....Duluth
Armstrong, E. L.....Duluth
Athens, A. G.....Duluth
Ayres, G. T.....Ely
Bagley, W. R.....Duluth
Barney, L. A.....Duluth
Berdez, G. L.....Duluth
Bergquist, K. E.....Duluth
Bianco, A. J.....Duluth
Binet, H. E.....Grand Rapids
Blacklock, S. S.....Hibbing
Blakely, C. C.....Barnum
Boman, P. G.....Duluth
Boyer, S. H.....Duluth
Braden, A. J.....Duluth
Bradley, E. L.....Duluth
Bray, C. W.....Biwabik
Briggs, F. W.....Duluth
Bullen, F. W.....Hibbing
Burns, H. J.....Duluth
Burns, R. L.....Two Harbors
Carstens, C. F.....Hibbing
Chapman, T. L.....Duluth
Cheney, E. L.....Duluth
Christensen, E. P...Two Harbors
Clark, F. F.....Duluth
Clement, T. G.....Duluth
Collins, A. N.....Duluth
Collins, H. C.....Duluth
Coventry, Wm. A.....Duluth
Crowe, J. H.....Virginia
Davis, B. F.....Duluth
Davis, H. S.....Duluth
Doolittle, L. E.....Duluth
Drenning, F. C.....Duluth
Ecklund, C. T.....Hibbing
Eckman, P. F.....Duluth
Eckblad, J. W.....Duluth
Eklund, Wm. J.....Duluth
Elias, F. J.....Duluth
Empie, W. M.....Virginia
Eppard, R. M.....Cloquet
Estrem, Theo. A.....Hibbing
Ferreira, G. J.....Aurora
Fischer, Mario McC.....Duluth
Forbes, R. S.....Duluth
Fuerste, Fred.....Proctor
Gauthier, W. L.....Virginia
Gendron, J. F.....Grand Rapids
Gilbert, J. D.....Carlton
Gillespie, M. G.....Duluth
Gillespie, N. H.....Duluth
Giroux, A. A.....Duluth
Graham, David.....Duluth
Graham, R. D.....Duluth
Graham, Robt.....Duluth
Grawn, F. A.....Duluth
Greeley, L. Q.....Duluth
Grover, F. E.....Duluth
Haney, C. L.....Duluth
Hatch, W. E.....Duluth
Heimark, O. E.....Duluth
Hill, F. E.....Duluth
Hirschboeck, F. J.....Duluth
Hirschfield, M. S.....Duluth
Hovde, H. .....Duluth
Jensen, T. J.....Duluth
Kean, N. D.....Coleraine
Keyes, C. R.....Duluth
King, Wm. S.....Eveleth
Klein, Harry .....Duluth

Knapp, F. N.....Duluth
Kolbry, Carl O.....Duluth
Kraft, P.....Duluth
Kuth, J. R.....Duluth
Laird, A. T.....Nopeming
Lepak, F. J.....Duluth
Lindgren, E. I.....Duluth
Litman, S. N.....Meadowlands
Lum, C. E.....Duluth
McCarty, P. D.....Babbitt
McComb, C. F.....Duluth
McCoy, Mary.....Duluth
McDonald, A. L.....Duluth
McGiffert, E. N.....Duluth
McHaffie, O. L.....Duluth
McIntyre, E. H.....Virginia
McMurtry, W. C.....Virginia
MacRae, Gordon C.....Duluth
Magie, W. H.....Duluth
Magney, F. H.....Duluth
Manley, J. R.....Duluth
Mattill, P. M.....Oak Terrace
Merriman, L. L.....Duluth
Monroe, P. B.....Soudan
Morcom, H. W.....Duluth
More, C. W.....Eveleth
Morsman, L. W.....Hibbing
Morss, C. R.....Zumbrota
Murray, D. D.....Duluth
Nelson, E. H.....Chisholm
Nicholson, M. A.....Duluth
Olson, A. E.....Duluth
Oredson, O. A.....Duluth
Paradine, D. J.....Duluth
Parker, O. W.....Ely
Payette, C. H.....Duluth
Pennie, D. F.....Duluth
Power, J. E.....Duluth
Raadquist, C. S.....Hibbing
Radtke, H. P.....Chisholm
Raiter, F. W. S.....Cloquet
Raiter, Roy F.....Cloquet
Rippert, J. A.....Duluth
Robinson, J. M.....Duluth
Rood, D. C.....Duluth
Rowe, O. W.....Duluth
Rudie, P. S.....Duluth
Ryan, W. J.....Duluth
St. Clair, G. G.....Duluth
Scherer, C. A.....Duluth
Schroeder, C. H.....Duluth
Schwartz, A. H.....Duluth
Seashore, D. E.....Duluth
Shapiro, E. Z.....Duluth
Slyfield, F. F.....Duluth
Smith, C. M.....Duluth
Smith, E. K.....Duluth
Spicer, F. W.....Duluth
Strobel, W. G.....Duluth
Stuart, A. B.....Cloquet
Sukeforth, L. A.....Duluth
Sutherland, H. N.....Ely
Taylor, A. C.....Duluth
Taylor, C. W.....Duluth
Tibbitts, M. H.....Duluth
Tilderquist, D. L.....Duluth
Tuohy, E. L.....Duluth
Turnbull, F. M.....Duluth
Urberg, S. E.....Duluth
Van de Steeg, Wm. G...Biwabik
Vercelline, C. E.....Duluth
Walker, A. E.....Duluth
Walters, F. R.....
.....Battle Creek, Mich.
Webber, E. E.....Proctor
Weber, Manuel L.....Duluth
Webster, H. E.....Duluth
Wheeler, D. W.....Duluth
Wilkinson, Stella L.....Duluth
Winter, J. A.....Duluth
Young, Thomas O.....Duluth
Young, V. A.....Duluth
Zlatowski, Michael.....Duluth

SCOTT-CARVER MEDICAL SOCIETY

Regular meetings, first Thursday in March, June, September and December.
Annual meeting, first Thursday in December.

President
Buck, F. H.....Shakopee

Secretary
Reiter, H. W.....Shakopee

Buck, Fred H.....Shakopee

Fischer, H. P.....Shakopee
Fischer, P. M.....Shakopee
Hebeisen, M. B.....Carver
Henriksen, H. G.....Elko
Juergens, H. M.....Belle Plaine
McKeon, James.....St. Paul
Maertz, W. F.....New Prague
Moloney, G. R.....Belle Plaine
Morris, Francis J.....Prior Lake
Reiter, H. W.....Shakopee
Schneider, H. A.....Jordan
Simons, Bern H.....Chaska
Westerman, F. C....Montgomery

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

Pipestone, Rock, Murray, Nobles, Cottonwood and Jackson Counties
Regular meetings, May and November.
Annual meeting, November.

President
Doms, H. C.....Slayton

Secretary
McKeown, E. G.....Pipestone

Arnold, E. W.....Adrian
Atkins, G. L.....Jackson
Basinger, Harvey R.....
.....Mountain Lake
Benjamin, W. G.....Pipestone
Bofenkamp, F. W.....Luverne
Bong, J. H.....Jasper
Brown, A. H.....Pipestone
Chadbourn, A. G.....Heron Lake
Cress, P. J.....Ellsworth
De Boer, Herman.....Edgerton

Ditmeier, L. M. Gerber....Jasper
Dolan, C. P.....Worthington
Doms, H. C.....Slayton
Doms, Wm.....Woodstock
Dudley, J. H.....Windom
Golden, C. M.....Tyler
Halloran, Walter.....Jackson
Hilger, J. M.....Iona
Johnson, Ellsworth .....Windom
Keeling, F. L.....Lakefield
Knudtson, H. M.....Browerville
Lowe, Thos.....Pipestone
McCrea, Jas.....Fulda
McKeown, E. G.....Pipestone
Manson, F. M.....Worthington
Metcalf, F. W.....Fulda
Mork, B. O.....Worthington
Nusbaum, W. H..Storm Lake, Ia.
Patterson, W. E.....Westbrook
Piper, Wm. A.....Mountain Lake
Richardson, W. E.....Pipestone
Rose, J. T.....Lakefield
Sherman, C. L.....Luverne
Slater, S. A.....Worthington
Smallwood, J. T.....Worthington
Sogge, L.....Windom
Stanley, C. R.....Worthington
Taylor, Wm. J.....Pipestone
Thorson, E. O.....Luverne
Tiedeman, E. J.....Adrian
Tiedeman, I. D.....Heron Lake
Tofte, Josephine.....Fisher
Waller, Jas. D.....Wilmont
Watson, F. G.....Worthington
Williams, L. A.....Slayton
Wright, C. O.....Luverne

STEARNS-BENTON COUNTY MEDICAL SOCIETY

Regular meetings, third Thursday in January, April, July and October
Annual meeting, third Thursday in April.

President
Friesleben, Wm.....Sauk Rapids
Secretary
Libert, J. N.....St. Cloud

Adams, L. P.....Sauk Rapids
Beaty, James H.....St. Cloud
Boehm, John C.....St. Cloud
Brigham, C. F.....St. Cloud
Clark, Harry B.....St. Cloud
Du Bois, Julian F...Sauk Center
Fleming, T. N.....St. Cloud
Freeman, W. L.....St. Cloud
Friesleben, Wm.....Sauk Rapids
Gelz, J. J.....St. Cloud
Goehrs, H. W.....St. Cloud

Haberman, E.....Osakis
Hemstead, Werner.....St. Cloud
Holdridge, G. A.....Foley
Jones, R. N.....Richmond
Kern, M. J.....St. Cloud
Kingsbury, E. M.....Clearwater
Kohler, D. W.....St. Joseph
Kuhlman, Aug.....Melrose
Lewis, E. J.....St. Cloud
Lewis, C. B.....St. Cloud
Libert, J. N.....St. Cloud
McDowell, J. P.....St. Cloud
McKibben, H. E.....St. Cloud
Mahwold, A.....Albany
Meyer, A. A.....Melrose
Moynihan, And. F...Sauk Center
Myre, C. R.....Paynesville
Pfaff, E. K.....Shoals, Ind.
Pilon, P. C.....Paynesville
Rathbun, A. M.....Rice
Rathbun, C. A.....St. Cloud
Rice, G. D.....St. Cloud
Richards, W. B.....St. Cloud
Richardson, Fred S.....Belgrade
Ridgeway, Alex.....Belgrade
Schatz, F. J.....St. Cloud
Sherwood, G. E.....Kimball
Stangl, Fred.....St. Cloud
Stangl, P. E.....St. Cloud
Sutton, Chas. S.....St. Cloud
Sweetman, R. H.....Sauk Center
Townsend, D.....Brooten

STEELE COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday in each month.
Annual meeting, December 9.

President
Quigley, T. C.....Owatonna

Secretary
McIntyre, J. A.....Owatonna

Andrist, J. W.....Owatonna

Ertel, E. Q.....Ellendale
Gamble, R. M.....Ellendale
Gault, C. C.....Owatonna
Hart, A. B.....Owatonna
McIntyre, J. A.....Owatonna
Melby, B.....Blooming Prairie
Peterson, C.....Owatonna
Quigley, T. C.....Owatonna
Senn, E. W.....Owatonna
Smersh, F. M.....Owatonna
Smersh, J. F.....Owatonna
Stewart, A. B.....Owatonna
Thimsen, N. C...Blooming Prairie

UPPER MISSISSIPPI MEDICAL SOCIETY

Aitkin, Crow Wing, Morrison, Cass, Todd, Wadena, Clearwater, Koochiching, Hubbard, Itasca and Beltrami Counties.

Regular meetings in June and January.

Annual meeting in January.

President
Smith, B. A.....Crosby

Secretary
Badeaux, G. I.....Brainerd

Anderson, Arnold S.....
.....AhGwahChing
Badeaux, G. I.....Brainerd
Beise, R. A.....Brainerd
Bone, Merle.....Kelliher
Christie, G. R.....Long Prairie
Christie, Robert L..Long Prairie
Corrigan, J. E.....Spooner
Crowl, Verne C.....Bertha
Davis, Lloyd T.....Wadena
Davis, T. C.....Wadena
Forrest, C. G.....Clearbrook
Garlock, A. V.....Bemidji
Garlock, D. H.....Bemidji
Gerber, M. P.....Brainerd
Gilmore, R. F.....Bemidji
Hawkinson, L. F.....Brainerd
Healy, R. T.....Pierz
Hermanson, Peter E....Brainerd
Holman, E. E.....Pine River
Holst, C. F.....Little Falls
Holst, J. B.....Little Falls
House, Z. E.....Cass Lake
Hvoslef, Jacob .....
.....International Falls
Johnson, O. V.....Sebeka
Kelly, B. W.....Aitkin
Kerlan, S. Z.....Aitkin
Laney, R. L.....Puposkey
Larson, L. M.....Brainerd
Miller, W. A.....New York Mills
Millspaugh, J. G.....Little Falls
McCann, D. F.....Bemidji
McHugh, R. F.....Aitkin
Nelson, Nesmuth .....Brainerd
Nordin, C. G.....St. Paul
Ortman, John Wessel.....Pierz
Osburn, B. F..International Falls
Pierce, C. H.....Wadena
Ratcliffe, J. J.....Aitkin
Roberts, L. M.....Little Falls
Reeves, C. E.....Eagle Bend
Shannon, S. S.....Crosby
Simons, Edwin J.....Swanville
Slattery, P. A.....Red Lake
Smith, B. A.....Crosby
Smith, E. H.....Bemidji
Thabes, J. A.....Brainerd
VanValkenburg, F. W.....
.....Long Prairie
Waldie, Geo. McL.....Wabasha
Watson, John D.....Holdingford
Will, W. W.....Bertha
Williams, R. J.....Pine River

WABASHA COUNTY MEDICAL SOCIETY

Annual meeting, first Thursday after first Monday in July.

President
Fleischhauer, D. S.....Wabasha
Secretary
Wilson, W. F.....Lake City

Bayley, E. H.....Lake City
Bowers, H. E.....Lake City
Cochrane, W. J.....Lake City
Collins, J. S.....Wabasha
Dempsey, D. P.....Kellogg
Fleischhauer, D. S.....Wabasha
French, E. A.....Plainview
Radabaugh, R. C.....Hastings
Replogle, W. H.....Wabasha
Slocumb, J. A.....Plainview
Sutton, L. F.....Mazeppa
Wilson, W. F.....Lake City

WASECA COUNTY MEDICAL SOCIETY

Annual meeting, second Monday in December.

President
Miller, H. A.....Waseca
Secretary
Gallagher, B. J.....Waseca
Bergman, O. B.....Janesville
Blanchard, H. G.....Waseca
Chamberlin, W. A.....Waseca
Cory, W. M.....Waterville
Gallagher, B. J.....Waseca
Gardner, V. H.....Waseca
Hagen, H. O.....New Richland
Leopard, B. A.....New Richland
McIntire, H. M.....Waseca
Miller, H. A.....Waseca
O'Hara, J. J.....Janesville
Swartwood, F. A.....Waseca

WASHINGTON COUNTY MEDICAL SOCIETY

Regular meetings held on second Tuesday of the odd numbered months.

Annual meeting, November.

President
Stuhr, J. W.....Stillwater
Secretary
Josewski, R. J.....Stillwater

Boleyn, E. S.....Stillwater
Culver, L. G.....Stillwater
Haines, J. H.....Stillwater
Humphrey, W. R.....Stillwater
Josewski, R. J.....Stillwater
Hemingway, R. W.....Stillwater
Kalinoff, D.....Stillwater
Landeen, F. G.....Stillwater
Mingo, F. E.....Hugo
Newman, G. A.....Stillwater
Poirier, J. A.....Forest Lake
Sherman, C. H.....Bayport
Stuhr, J. W.....Stillwater
Thompson, V. C.....
.....Marine-on-St. Croix

WATONWAN COUNTY MEDICAL SOCIETY

Regular meetings, on call.

Annual meeting, first week in December.

President
McCarthy, W. J.....Madelia
Secretary
Grimes, H. M.....Madelia

Bregel, F. L.....St. James
Grimes, H. B.....Madelia
Hagen, O. E.....Butterfield
Hefke, Hans W.....St. James
McCarthy, W. J.....Madelia
Thompson, Albert.....St. James

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

Bigstone, Traverse, Stevens and Pope Counties.

Regular meetings, June and December.

Annual meeting, December 15

President
Weir, J. D.....Beardsley

Secretary
Linde, Herman.....Cyrus

Arnson, J. M.....Graceville
Bates, B. V.....Wheaton
Bergen, Otto.....Clinton
Bolsta, Chas.....Ortonville
Caine, C. E.....Morris
Cumming, J. F.....Chokio
Eberlin, E. A.....Glenwood
Elsey, J. R.....Glenwood
Ewing, C. F.....Wheaton
Fitzgerald, E. T.....Morris
Gibbon, L. L.....Lowry
Gray, Royal C.....Graceville
Jensen, Julius.....Starbuck
Judge, Walter T.....Graceville
Karn, B. R.....Ortonville
Leland, J. T.....Herman
Leuty, Amos.....Morris
Lindberg, A. L.....Wheaton
Linde, Herman .....Cyrus
Oliver, C. I.....Graceville
O'Donnell, D. M.....Ortonville
Opheim, O. V.....Starbuck
Pierson, Claude M.....Wheaton
Ransom, L. M.....Hancock
Shelver, H. J.....Ortonville
Weir, J. D.....Beardsley

WINONA COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday in January, April, July and October.
Annual meeting, second Tuesday in January.

President
Nauth, W. W.....Winona

Secretary
Steiner, I. W.....Winona

Adler, S. W.....Winona
Baer, H. C.....St. Charles
Benoit, F. T.....Winona
Clay, F. H.....St. Charles
Heise, W. F. C.....Winona
Keyes, E. D.....Winona
Leicht, O.....Winona
Lichtenstein, H.....Winona
Lindsay, W. V.....Winona
McLaughlin, E. M.....Winona
Nauth, W. W.....Winona
Neumann, C. A.....Lewiston
Neumann, W. H.....
.....Sheboygan, Wis.
Pritchard, D. B.....Winona
Risser, E. D.....Winona
Robbins, C. P.....Winona
Rosenberry, B. P.....Winona
Schaefer, S.....Winona
Schnarrenberger, G. .....
.....Rollingstone
Scott, J. W.....St. Charles
Steiner, I. W.....Winona
Tweedy, G. J.....Winona

WRIGHT COUNTY MEDICAL SOCIETY

Regular meetings, first Tuesday after first Monday quarterly.
Annual meeting, October.

President
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Catlin, John J.....Buffalo
Catlin, T. J.....Buffalo
Ellison, Frank.....Monticello
Freed, O. J. R.....Cokato
Harriman, L.....Howard Lake
Klaveness, E.....Monticello
Lee, J. L.....Watertown
Moffatt, A. G.....Howard Lake
Norris, G. H.....Annandale
Peterson, O. L.....Cokato
Phillips, A. E.....Delano
Ridgway, A. M.....Annandale
Roholt, C. L.....Waverly
Rousseau, Victor.....Maple Lake
Shrader, E. E.....Watertown
Sturges, C. J.....Buffalo
Swezey, B. F.....Buffalo
Thoresen, Th.....Brooklyn, N. Y.

ALPHABETICAL ROSTER

Aanes, A. M.....Red Wing
Abbott, A. W.....Minneapolis
Abbott, J. S.....St. Paul
Abbott, Wm. P.....Duluth
Abramovich, J. H.....St. Paul
Adair, F. L.....Minneapolis
Adams, B. S.....Hibbing
Adams, J. L.....Morgan
Adams, L. P.....Sauk Rapids
Adams, R. C.....Bird Island
Adams, Rollin T.....Mantorville
Adams, S. Franklin....Rochester
Adkins, C. M.....Grygla
Adler, Stuart Welsh.....Winona
Adson, A. W.....Rochester
Ahlfs, J. A.....Bemidji
Ahrens, A. E.....St. Paul
Ahrens, A. H.....St. Paul
Ahrens, R. S.....Minneapolis
Aitkins, H. B.....LeSueur Center
Akester, Ward.....Marshall
Alberts, Max W.....St. Paul
Alden, J. F.....St. Paul
Aldes, Harry.....St. Paul
Aldrich, F. H.....Belview
Alexander, F. H.....St. Paul
Allen, A. W.....Austin
Allen, Chas. C.....Austin
Allen, H. W.....Minneapolis
Allen, Mason.....St. Paul
Allen, Roy William....Rochester
Allen, W. A.....Rochester
Allison, R. G.....Minneapolis
Almquist, H. E.....Minneapolis
Amberg, Samuel.....Rochester
Anderson, A. E.....Minneapolis
Anderson, Arnold S.....
Ah Gwah Ching
Anderson, Arnt G....Minneapolis
Anderson, C. M.....Rochester
Anderson, David D...Minneapolis
Anderson, Edward Dyer.....
Minneapolis
Anderson, E. W.....Rochester
Anderson, Frank J...Minneapolis
Anderson, J. K.....Crookston
Anderson, J. V.....Red Wing
Anderson, Mark J.....Rochester
Anderson, Norman E....Harmony
Anderson, S. H.....Red Wing
Anderson, W. S.....Minneapolis
Anderson, W. T.....St. Paul
Andrews, J. W.....Mankato
Andrews, R. N.....Mankato
Andrist, J. W.....Owatonna
Annis, H. B.....Minneapolis
Archibald, Frank M....Mahnomen
Arey, H. C.....Excelsior
Arminen, K. V.....Duluth
Armstrong, E. L.....Duluth
Armstrong, J. M.....St. Paul
Arnold, E. W.....Adrian
Arnold, James E...Vernon Center
Arnquist, A. S.....St. Paul
Arnson, J. M. .....Graceville
Arouni, Khalil.....St. Paul
Arvidson, C. G.....Minneapolis
Arzt, C. P.....St. Paul
Asbury, J. T.....Rochester
Ash, Wilfrid Anthony...Rochester
Athens, A. S.....Duluth
Atkins, G. L.....Jackson
Aune, Martin.....Minneapolis
Aurand, W. H.....Minneapolis
Aurelius, J. Richards..Rochester
Avery, J. Fowler....Minneapolis
Axilrod, D. L.....Hutchinson
Aylmer, A. L.....Minneapolis
Ayres, G. T.....Ely

Babcock, F. M.....Northfield
Backe, Edmund.....Kenyon
Bacon, Donald K.....St. Paul
Bacon, L. C.....St. Paul
Bacon, R. S.....Montevideo
Badeaux, G. I.....Brainerd
Baer, H. C.....St. Charles
Bagley, W. R.....Duluth
Bailey, H. B.....Ceylon
Baken, Melvin P.....Minneapolis
Baker, A. C.....Fergus Falls
Baker, Alfred T.....Minneapolis
Baker, E. L.....Minneapolis
Baker, Looe.....Minneapolis
Bakke, O. H.....Minneapolis
Balch, Franklin G.....Rochester
Balcome, F. E.....St. Paul
Baldwin, A. E.....Brownsdale
Baldwin, L. B.....Minneapolis
Balfour, D. C.....Rochester
Ball, C. R.....St. Paul
Barborka, C. J.....Rochester
Barfield, J. J.....Granite Falls
Bargen, J. Arnold.....Rochester
Barnes, A. R.....Rochester
Barney, L. A.....Duluth
Barron, Moses.....Minneapolis
Barry, L. W.....St. Paul
Barsness, Nellie.....St. Paul
Basinger, Harvey R.....
Mountain Lake
Baskett, George I.....Willmar
Baskett, Olive T.....Willmar
Bass, G. W.....Minneapolis
Bates, B. V.....Browns Valley
Baxter, S. H.....Minneapolis
Bayley, E. H.....Lake City
Beach, Watson.....Rochester
Beadie, W. D.....Cannon Falls
Beals, Hugh.....St. Paul
Beard, Archie H.....Minneapolis
Beaty, J. H.....St. Cloud
Becker, Samuel William.....
Rochester
Bedford, E. W.....Minneapolis
Beede, Ethel.....Faribault
Behmier, Fred W.....Appleton
Beise, R. A.....Brainerd
Bell, C. C.....St. Cloud
Bell, J. W.....Minneapolis
Bell, W. E.....Dodge Center
Benedict, E. E.....Minneapolis
Benedict, W. L.....Rochester
Benepe, L. M.....St. Paul
Benham, E. W.....Mankato
Benjamin, A. E.....Minneapolis
Benjamin, W. G.....Pipestone
Benn, F. G.....Minneapolis
Bennion, P. H.....St. Paul
Benolt, F. T.....Winona
Benson, R. D.....Minneapolis
Bentley, Norman P.....St. Paul
Berdez, G. L.....Duluth
Bergen, Otto.....Clinton
Bergen, Ralph D.....Rochester
Bergh, L. N.....Montevideo
Bergheim, M. C.....Hawley
Bergman, O. B.....Janesville
Bergquist, K. E.....Duluth
Berkman, D. M.....Rochester
Bernard, B. C...Thief River Falls
Berrisford, Paul D.....St. Paul
Bertelson, O. L.....Crookston
Bessesen, A. N., Jr...Minneapolis
Bessesen, A. N., Sr...Minneapolis
Bessesen, Danlel H...Minneapolis
Bessesen, W. A.....Minneapolis
Best, F. E.....Wells
Bianco, A. J.....Duluth
Biedermann, Jacob.....
Thief River Falls
Bigelow, C. E.....Dodge Center
Binet, H. E.....Grand Rapids
Binger, H. E.....St. Paul
Birnberg, T. L.....St. Paul
Bissell, F. S.....Minneapolis
Bjorgo, C. W.....Cannon Falls
Blackford, Launcelot Mlnor....
Rochester
Blacklock, S. S.....Hibbing
Blake, Jas.....Hopkins
Blakely, C. C.....Barnum
Blanchard, H. G.....Waseca
Blanton, Smlley.....Minneapolis
Blaustone, Henry H...Minneapolis
Blegen, H. M.....Warren
Bliss, John Herbert....Rochester
Blumenthal, Jacob...Minneapolis
Bock, R. A.....St. Paul
Bockman, M. W. H...Minneapolis
Boeckmann, Eduard.....St. Paul
Boeckmann, Egil.....St. Paul
Boehm, J. C.....St. Cloud
Bofenkamp, F. W.....Luverne
Bohland, E. H.....St. Paul
Bohling, B. S.....Sandstone
Bole, R. S.....St. Paul
Boleyn, E. S.....Stillwater
Bolsta, Chas.....Ortonville
Bolstad, H. C.....St. Paul
Boman, P. G.....Duluth
Bone, Merle.....Kelliher
Bong, J. H.....Jasper
Bonta, M. B.....Rochester
Booth, A. E.....Minneapolis
Boothby, W. M.....Rochester
Boquist, E. T. W.....Minneapolis
Boreen, C. A.....Minneapolis
Borg, Joseph F.....St. Paul
Bargeson, Egbert J.....Rochester
Borreson, B.....Remer
Bossert, C. S.....Mora
Bossingham, O. N...Lake Benton
Bouma, L. R.....St. Paul
Bouman, H. A.....Minneapolis
Bowers, H. E.....Lake City
Bowers, J. T....Thief River Falls
Bowing, H. H.....Rochester
Bowles, John H.....Rochester
Boyer, S. H.....Duluth
Boynton, Ruth.....Minneapolis
Boysen, H.....Truman
Boysen, P.....Pelican Rapids
Braasch, Wm. F.....Rochester
Brabec, F. G.....Perham
Bracken, H. M....New York City
Braden, A. J.....Duluth
Brading, Edward Thurston....
Rochester
Bradley, E. L.....Superior
Brand, G. D.....St. Paul
Brand, W. A.....Redwood Falls
Braham, D. S.....Albert Lea
Branton, A. F.....Willmar
Branton, B. J.....Willmar
Bratrud, A. F.....Minneapolis
Bratrud, O. Edward.....Warren
Bratrud, Theodor.....Warren
Bray, C. W.....Biwabik
Bray, E. R.....St. Paul
Bregal, Fred L.....St. James
Briggs, F. W.....Duluth
Brigham, C. F.....St. Cloud
Brigham, Frank.....Watkins
Brimhall, J. B.....St. Paul
Broders, A. C.....Rochester
Brodie, Walter D.....St. Paul
Broker, W. S.....Battle Lake
Brooks, Chas. N.....Minneapolis
Brooks, D. F.....St. Paul
Brooks, G. F.....St. Paul
Brown, A. E.....Rochester
Brown, A. H.....Pipestone
Brown, Edgar D.....Minneapolis
Brown, Ed. I.....St. Paul
Brown, Edw. J.....Minneapolis
Brown, G. E.....Rochester
Brown, John C.....St. Paul
Brown, Lyle L.....Crookston
Brown, P. W.....Rochester
Brown, R. S.....Minneapolis
Browning, W. E.....Caledonia
Bryout, Oliver R.....Minneapolis
Buck, Fred H.....Shakopee
Bueerman, Winifred Henry....
Rochester
Buie, L. A.....Rochester
Bullen, F. W.....Hibbing
Bumpus, H. C.....Rochester
Burch, F. E.....St. Paul
Burfiend, G. H.....St. Paul
Burnap, W. L.....Fergus Falls
Burns, Arthur.....Rochester
Burns, F. W.....St. Paul
Burns, H. D.....Albert Lea
Burns, H. J.....Duluth
Burns, M. A.....Milan
Burns, R. L.....Two Harbors
Burns, R. M.....St. Paul
Buscher, H.....St. Paul
Bushey, M. E.....Arlington
Butler, John.....Minneapolis
Butturff, C. R.....Freeborn
Butz, J. A.....Monterey
Byrnes, W. J.....Minneapolis

Cabot, V. S.....Minneapolis
Cady, L. H.....Minneapolis
Caine, C. E.....Morris
Caldwell, David K.....St. Paul
Caldwell, Jas. P.....St. Paul
Caldwell, Kenneth S....St. Paul
Caley, G. R.....Princeton
Calhoun, F. W.....Albert Lea

Callahan, F. F.....Pokegama
Cameron, J. A.....St. Paul
Camp, W. E.....Minneapolis
Campbell, J. E.....South St. Paul
Campbell, L. M.....Minneapolis
Campbell, Robert....Minneapolis
Cannon, Harry.....St. Paul
Carey, Jas. B.....Minneapolis
Carlaw, C. M.....Minneapolis
Carman, Paul.....St. Paul
Carman, Russell Daniel.....
Rochester
Carroll, Wm. C.....St. Paul
Carstens, C. F.....Hibbing
Carter, Fred G.....St. Paul
Cathcart, E. P.....Rochester
Catlin, John J.....Buffalo
Catlin, T. J.....Buffalo
Cavanaugh, J. O.....St. Paul
Caylor, Harold D.....Rochester
Chadbourn, A. G.....Heron Lake
Chamberlin, W. A.....Waseca
Chambers, W. C.....Blue Earth
Chandler, O. B.....St. Paul
Chapman, T. L.....Duluth
Chatterton, C. C.....St. Paul
Cheleen, S. J.....Minneapolis
Cheney, E. L.....Duluth
Cherry, Chas. H.....Minneapolis
Chorest, J. C. R.....Marshall
Christensen, E. P...Two Harbors
Christiansen, A.....St. Paul
Christenson, C. R.....Starbuck
Christianson, H. W.....Wykoff
Christie, G. R.....Long Prairie
Christie, R. L.....Long Prairie
Christison, J. T.....St. Paul
Chumley, Charles L.....Rochester
Cirkler, A. A.....Minneapolis
Clair, J. B.....Winsted
Clark, F. F.....Duluth
Clark, H. B.....St. Cloud
Clark, H. S.....Minneapolis
Clark, T. C.....Minneapolis
Clay, E. M.....Hutchinson
Clay, F. H.....St. Charles
Claydon, L. E.....Red Wing
Clement, T. G.....Duluth
Clement, J. B.....Lester Prairie
Clifford, F. F.....West Concord
Clifton, Theo. A.....Chatfield
Cobb, S. G.....St. Paul
Cobb, Willis F.....Lyle
Cochrane, W. J.....Lake City
Coffey, Jay R.....Rochester
Colby, Woodard.....St. Paul
Cole, H. B.....Redwood Falls
Cole, Wallace H.....St. Paul
Coleman, F. B.....Austin
Collie, H. G.....St. Paul
Collins, A. N.....Duluth
Collins, Harry R.....Rochester
Collins, H. C.....Duluth
Collins, J. S.....Wabasha
Colvin, A. R.....St. Paul
Comfort, Mandred Whitset..
.....Rochester
Comstock, A. E.....St. Paul
Condit, W. H.....Minneapolis
Conley, Alva A.....Cannon Falls
Conner, H. M.....Rochester
Conner, Wm. H.....St. Paul
Connor, C. E.....St. Paul
Constans, Geo. Maurice.....
.....Rochester
Cook, Henry Wireman.....
.....Minneapolis
Cook, Paul B.....St. Paul
Cooney, H. C.....Princeton
Cooper, M. D.....Winnebago City
Cooperman, H. O.....Minneapolis
Corbett, J. Frank...Minneapolis
Corrigan, J. E.....Spooner
Cory, W. M.....Waterville
Cosgriff, J. A.....Mankato
Cosman, E. O.....Minneapolis
Counseller, Virgil S....Rochester
Countryman, Roger S.....St. Paul
Covell, W. W.....St. Peter
Coventry, W. A.....Duluth
Cowern, E. W.....North St. Paul
Cowing, P. G.....Evansville
Crafts, Leo M.....Minneapolis
Craig, Wm. McK.....Rochester
Crane, Wm. Whitfield, Jr.....
Rochester
Cranmer, Richard R.....
Minneapolis
Creighton, Ralph H...Minneapolis
Cremer, M. H.....Red Wing
Cremer, Peter Hubert...Hastings
Crenshaw, J. L.....Rochester
Cress, E. E.....Boyd
Cress, P. J.....Ellsworth
Crewe, J. E.....Rochester
Critchfield, L. R.....St. Paul
Cross, J. G.....Minneapolis
Crow, E. R.....Minneapolis
Crowe, J. H.....Virginia
Crowl, Verne C.....Downey
Crume, Geo. P.....Minneapolis
Crump, J. W.....St. Paul
Culligan, Leo Courtney.....
Rochester
Culver, Luclan Glenn...Stillwater
Cumming, J. F.....Chokio
Curtin, John F.....Minneapolis
Cutts, G. A. C.....Litchfield
Cutts, George.....Minneapolis

Dack, Lloyd G.....St. Paul
Dady, Elmer E.....Minneapolis
Dahl, Elmer O.....Minneapolis
Dahl, G. A.....Mankato
Dahl, John A.....Minneapolis
Daignault, Oscar.....Benson
Daly, Joseph.....Rochester
Daniel, Donald H.....Minneapolis
Daniel, Lewis M.....Minneapolis
Daniels, J. W.....St. Peter
Daniels, W. H.....Crookston
Danielson, K. A.....Litchfield
Darling, J. B.....St. Paul
Dart, Leslie O.....Minneapolis
Daugherty, E. B.....St. Paul
Daugherty, L. E.....St. Paul
Davis, Austin Clifford.....
Rochester
Davis, B. F.....Duluth
Davis, F. U.....Faribault
Davis, Herbert.....St. Paul
Davis, H. S.....Duluth
Davis, I. Grant.....Rushford
Davis, Lloyd Thomas....Wadena
Davis, Thayer Clinton...Wadena
Davis, William.....St. Paul
Davison, P. C.....Willmar
De Boer, Hermann.....Edgerton
Dedolph, Karl.....St. Paul
Delmore, J. L.....Roseau
Dempsey, D. P.....Kellogg
Denman, A. V.....Mankato
Desjardins, Arthur W.....
Rochester
Devereaux, T. G.....Wayzata
Dezell, Earl R.....Minneapolis
Deziel, G.....Minneapolis
Dickson, Thos. H., Jr.....St. Paul
Diehl, Harold S.....Minneapolis
Diessner, H. D.....Minneapolis
Disen, C. F.....Minneapolis
Ditmeier, L. M. Gerber....Jasper
Dittman, Geo. C.....St. Paul
Dixon, Claude F.....Rochester
Dobson, Herbert Victor.....
.....Rochester
Doctor, William R...Minneapolis
Dodge, F. A.....Le Sueur
Dohm, A. J.....St. Paul
Dolan, C. P.....Worthington
Dolder, F. C.....Eyota
Doms, H. C.....Slayton
Doms, Wm.....Woodstock
Donaldson, C. A.....Minneapolis
Donohue, P. F.....St. Paul
Doolittle, L. E.....Duluth
Dorge, Richard I.....Minneapolis
Dowswell, W. J.....Benson
Doxey, G. L.....Minneapolis
Drake, Carl B.....St. Paul
Drake, C. R.....Minneapolis
Drake, F. A.....Lanesboro
Dredge, H. P.....Sandstone
Drenning, F. C.....Duluth
Driesbach, N.....Minneapolis
Drips, D. G.....Rochester
Drought, W. W.....Fergus Falls
Dryden, F. M.....Crookston
Dubbe, F. H.....New Ulm
DuBois, J. F.....Sauk Center
Dudley, J. H.....Windom
Dulude, S.....Dassel
Dumas, Alexander G.....
.....Minneapolis
Dunlap, E. H.....Minneapolis
Dunlap, H. F.....Rochester
Dunlap, Alex.....Crookston
Dunn, Geo. Robt.....Minneapolis
Dunn, J. N.....St. Paul
Dunn, Louis.....Minneapolis
Dunne, Gerald P.....St. Paul
Dunsmoor, F. A.....Minneapolis

Earl, George A.....St. Paul
Earl, Robert O.....St. Paul
Eberlin, E. A.....Glenwood
Eby, C. B.....Spring Valley
Ecklund, E. C.....Hibbing
Eckman, P. F.....Duluth
Eckstein, A. W.....Comfrey
Edlund, G.....St. Paul
Edwards, Ralph T.....Elysian
Eirley, Clara G.....
.....Mt. Pleasant, Iowa
Eisler, Edwin R.....Boston
Eitel, Geo. D.....Minneapolis
Eitel, G. G.....Minneapolis
Egilsrud, Kristian...Minneapolis
Ehrenberg, C. J.....Minneapolis
Ekblad, J. W.....Duluth
Eklund, Wm. J.....Duluth
Elias, F. J.....Duluth
Ellison, David E.....Minneapolis
Ellison, Frank E.....Monticello
Elsey, J. R.....Glenwood
Ely, O. S.....South St. Paul
Emerson, E. C.....St. Paul
Empie, W. M.....Virginia
Endress, E. K.....St. Paul
Engberg, E. J.....St. Paul
Engelhart, P. C.....Wood Lake
Engh, Sigfred.....Cottonwood
Erb, F. A.....Minneapolis
Ericson, J. A.....Minneapolis
Ericson, Swan.....Le Sueur
Ernest, G. C.....St. Paul
Ertel, E. Q.....Ellendale
Eshelby, E. C.....St. Paul
Eskew, Don Carlos.....Rochester
Esser, John.....Perham
Estrem, C. O.....Fergus Falls
Estrem, T. A.....Hibbing
Eusterman, G. B.....Rochester
Evarts, Arrah B.....Rochester
Everlop, J. L.....Minneapolis
Ewing, C. F.....Wheaton

Fahey, E. W.....St. Paul
Fansler, W. A.....Minneapolis
Farr, R. E.....Minneapolis
Farrell, J. C.....Arlington
Farrist, R. C.....Sherburn
Faust, Louis Sanders..Rochester
Fawcett, C. E.....Stewartville
Feidt, W. M.....Minneapolis
Ferguson, J. C.....St. Paul
Ferreira, G. J.....Aurora
Fesler, Harold H.....St. Paul
Figi, F. A.....Rochester
Fink, Walter H. ...Minneapolis
Finney, W. P.....Rochester
Fischer, G.....Minneapolis
Fischer, H. P.....Shakopee
Fischer, O. F.....Houston
Fischer, Mario McC.....Duluth
Fischer, P. M.....Shakopee
Fischback, Frederic C..Rochester
Fisher, J. M.....St. Peter
Fitzgerald, E. T.....Morris
Fjeldstad, C. Alfred..Minneapolis
Fjellman, R. C. .....Minneapolis
Flagstad, A. E.....St. Paul
Fleischhauer, D. S.....Wabasha
Fleming, A. S.....Minneapolis
Fleming, James.....Cloquet
Fleming, T. N.....St. Cloud
Flinn, B. P.....Redwood Falls
Flinn, F. E.....Redwood Falls
Flocken, Chas. F.....Minneapolis
Flom, A. O.....Chisago City
Flothow, Paul G.....Rochester
Flower, W. Z.....Minneapolis
Fogarty, Chas. W.....St. Paul
Foley, F. E. B.....St. Paul
Folken, F. G.....Albert Lea
Forbes, R. S.....Duluth
Ford, Burton C.....Marshall
Ford, Frances A.....Rochester
Forrest, C. G.....Clearbrook
Forsberg, Carl W.....Rochester
Fowler, L. H.....Minneapolis
Franchere, F. W.....Lake Crystal
Franzen, H. G.....Minneapolis
Freeborn, J. A.....Fergus Falls
Freed, O. J. R.....Cokato
Freeman, C. D.....St. Paul
Freeman, G. E.....St. Peter
Freeman, J. P.....Glenville
Freeman, W. L.....St. Cloud
French, E. A.....Plainview
French, H. S.....New London
Friedell, A.....Minneapolis
Friesleben, Wm.....Sauk Rapids
Frisch, F. P.....Richmond
Fritsche, Albert.....New Ulm
Fritsche, L. A.....New Ulm
Froelich, H. W..Thief River Falls
Frost, E. H.....Willmar
Fuerste, Frederick.....Proctor
Fugina, George R.....Mankato
Fulton, J. F.....St. Paul

Gaarde, F. W.....Rochester
Gager, E. C.....St. Paul
Gaines, E. C.....Buffalo Lake
Gallagher, B. J.....Waseca
Gamble, J. W.....Albert Lea
Gamble, P. M.....Albert Lea
Gamble, Ross M.....Ellendale
Gammell, J. H.....Minneapolis
Garbrecht, Arthur.....St. Paul
Gardiner, D. G.....St. Paul
Gardner, Edwin L....Minneapolis
Gardner, V. H.....Waseca
Garlock, A. V.....Bemidji
Garlock, D. H.....Bemidji
Garwin, John Day.....Rochester
Gates, C. E.....Anoka
Gault, C. C.....Owatonna
Gausemel, S. D.....Goodhue
Gay, James G.....Rochester
Gauthier, W. L.....Virginia
Geer, Everett K.....St. Paul
Geissenger, John D.....St. Paul
Geist, Emil S.....Minneapolis
Geist, George A.....St. Paul
Gelz, J. J.....St. Cloud
Gendron, J. F.....Grand Rapids
Gerber, Milo P.....Brainerd
Germo, Chas.....Balaton
Ghent, C. Harry.....St. Paul
Ghent, M. M.....St. Paul
Gibbon, L. L.....Lowry
Giere, E. O.....St. Paul
Giessler, Paul W.....Minneapolis
Giffin, H. Z.....Rochester
Gilbert, John D.....Carlton
Gilfillan, J. S.....St. Paul
Gilles, F. L.....Minneapolis
Gillespie, N. H.....Duluth
Gillespie, M. G.....Duluth
Gilmore, R.....Bemidji
Ginsberg, Wm.....St. Paul
Gipner, John F.....Rochester
Giroux, A. A.....Duluth
Goeckerman, W. H.....Rochester
Goehrs, H. W.....St. Cloud
Goldberg, Isadore M..Minneapolis
Golden, C. M.....Tyler
Goltz, E. V.....St. Paul
Goodson, Catherine M.....
.....Retreat, Pa.
Gordon, Geo. J.....Minneapolis
Gosin, D. F.....Minneapolis
Gosslee, G. L.....Moorhead
Gough, W. H.....Granada
Graham, David.....Duluth
Graham, R. D.....Duluth
Graham, Robert.....Duluth
Grant, H. W.....St. Paul
Gratzek, Thos.....St. Paul
Grave, Floyd.....Minneapolis
Grawn, F. A.....Duluth
Gray, F. D.....Marshall
Gray, Royal C.....Graceville
Greeley, L. Q.....Duluth
Green, E. K.....Minneapolis
Greene, Carl Hartley..Rochester
Greene, Charles L.....St. Paul
Greene, Earle Ira....Rochester
Greene, W. P.....Minneapolis
Greenlee, Daniel P....Rochester
Greisheimer, Esther M.....
.....Minneapolis
Griffin, P. J.....Gary
Grimes, H. B.....Madelia
Grinnell, W. B.....Preston
Grise, W. B.....Austin
Grob, Otto.....Rochester
Ground, H. T.....Virginia
Grover, F. E.....Duluth
Gruenhagen, Arnold P....St. Paul
Gullixson, A.....Albert Lea
Gunderson, Harley J.....
.....Minneapolis
Gunderson, Nels A...Minneapolis
Gunz, A. N.....Center City

Habein, Harold C.....Rochester
Haberman, E.....Osakis
Hacking, Frank H...Minneapolis
Haessley, S. B.....Faribault
Hagaman, Geo. K.....St. Paul
Hagen, G. L.....Minneapolis
Hagen, H. O.....New Richland
Hagen, O. E.....Butterfield
Hagen, O. J.....Moorhead
Haggard, G. D.....Minneapolis
Haight, G. G.....Audubon
Haines, J. H.....Stillwater
Haines, S. F.....Rochester
Hall, A. R.....St. Paul
Hall, E. L.....Princeton
Hall, J. M.....Minneapolis
Hallberg, C. A.....Rochester
Hallenbeck, D. F.....Rochester
Halloran, Walter J.....Jackson
Halper, Philip.....St. Paul
Hamel, Arnold L.....Minneapolis
Hamilton, A. S.....Minneapolis
Hamlin, George B...Minneapolis
Hammermeister, Theodore F...
.....New Ulm
Hammes, E. M.....St. Paul
Hammond, A. J.....Minneapolis
Hammond, J. F.....St. Paul
Hamrick, Robert A....Rochester
Hand, John R.....Rochester
Hand, W. R.....Elbow Lake
Haney, C. L.....Duluth
Hanse, Elmer H.....Minneapolis
Hansen, Erling.....Minneapolis
Hansen, Olga S.....Minneapolis
Hanson, A. M.....Faribault
Hanson, H. J.....Minneapolis
Hanson, H. V.....Minneapolis
Hare, E. R.....Minneapolis
Hargis, Estes Henry...Rochester
Harmon, G. E.....St. Paul
Harriman, L.....Howard Lake
Harrington, C. D....Minneapolis
Harrington, Ethel R...Rochester
Harrington, F. E....Minneapolis
Harrington, S. W.....Rochester
Harshbarger, Isaac Long.....
.....Rochester
Hart, A. B.....Owatonna
Hartley, E. C.....St. Paul
Hartman, H. R.....Rochester
Hartzell, Thos. B....Minneapolis
Hatch, W. E.....Duluth
Hauge, M. M.....Clarkfield
Haugen, G. T.....Fergus Falls
Hassett, Roger G....Bird Island
Hauser, V. P.....St. Paul
Haverfield, Addie K...Minneapolis
Hawkins, V. J.....St. Paul
Hawkinson, L. F.....Brainerd
Hayes, J. M.....Minneapolis
Head, G. D.....Minneapolis
Healy, R. T.....Pierz
Hearn, Wm. O.....Minneapolis
Heath, A. C.....St. Paul
Hebeisen, M. B.....Carver
Hedback, A. E.....Minneapolis
Hedenstrom, L. H....Cambridge
Heetdecks, D. R.....Rochester
Hefke, Hans W.....St. James
Hegge, C. A.....Austin
Hegge, O. H.....Austin
Heim, Russell R....Minneapolis
Heimark, J. H.....Moorhead
Heimark, O. E.....Duluth
Heise, W. F. C.....Winona
Helk, H. H.....Minneapolis
Helland, G. M.....Spring Grove
Helland, J. W.....Spring Grove
Helmholz, H. F.....Rochester
Hemingway, Robert W.....
.....Stillwater
Hempstead, B. E.....Rochester
Hemstead, Werner.....St. Cloud
Hench, Philip S.....Rochester
Henderson, A. J.....Kiester
Henderson, Earl Fletcher.....
.....Rochester
Henderson, M. S.....Rochester
Hendrickson, J. F...Minneapolis
Hengstler, W. H.....St. Paul
Henney, Wm. H.....McIntosh
Henriksen, H. G.....Elko
Henry, C. E.....Minneapolis
Henry, Myron O.....Minneapolis
Hensel, C. N.....St. Paul
Henslin, A. E.....Le Roy
Herbst, Wm. P.....Minneapolis
Herman, Arthur L...Minneapolis
Hermanson, Peter E....Brainerd
Herrmann, S. F.....Welcome
Hertel, G. E.....Austin
Hesselgrave, S. S.....St. Paul
Heyerdale, O. C.....Rochester
Hiebert, J. P.....Minneapolis
Hielscher, Helen H.....Mankato
Hielscher, Julian A....Mankato
Higbee, Paul A.....Minneapolis
Higgins, J. H.....Minneapolis
Hilger, A. W.....St. Paul
Hilger, D. D.....St. Paul
Hilger, J. M.....Iona
Hilger, L. A.....St. Paul
Hill, Eleanor J.....Minneapolis
Hill, Frederick E.....Duluth
Hirschboeck, F. J.....Duluth
Hirschfield, F. R....Minneapolis
Hirschfield, M. S.....Duluth
Hoaglund, A. W.....Minneapolis
Hobbs, C. A.....Minneapolis
Hochfilzer, J. J.....St. Paul
Hodapp, R. J.....Willmar
Hodge, S. V.....Minneapolis
Hodgson, H. H.....Crookston
Hoff, Alfred.....St. Paul
Hoff, Peder A.....St. Paul
Hoffman, Max H.....St. Paul
Hoidale, A. D.....Tracy
Hoiland, A. S.....Minneapolis
Holbrook, J. S.....Mankato
Holcomb, J. T.....St. Paul
Holcomb, O. W.....St. Paul
Holdridge, Geo.....Foley
Holen, T.....Minneapolis
Holl, P. M.....Minneapolis
Holland, W. H.....Fisher
Holm, Geo. A.....Minneapolis
Holm, H. H.....Glencoe
Holman, C. J.....Mankato
Holman, E. E.....Pine River
Holmberg, L. J.....Canby
Holmes, A. E.....Rush City
Holmes, W. B.....Ada
Holloway, Jackson K.....
.....Rochester
Holst, C. F.....Little Falls
Holst, J. B.....Little Falls
Holte, H.....Crookston
Horton, Bayard A.....Rochester
Horwitz, Alex.....Rochester
House, Z. E.....Cass Lake
Hovde, H.....Duluth
Howard, Merrill A.....St. Paul
Howard, William H...Minneapolis
Howard, W. S.....St. Paul
Huenekens, E. K.....Minneapolis
Huffman, Lester Dale..Rochester
Hufford, Alvin Ray....Rochester
Hughes, Louis D.....Minneapolis
Hultkrans, Joel C.....St. Paul
Humphrey, E. W.....Moorhead
Humphrey, W. R.....Stillwater
Hunt, F. N.....Fairmont
Hunt, H. E.....St. Paul
Hunt, India.....Rochester
Hunt, R. C.....Fairmont
Hunt, V. C.....Rochester
Hunte, A. F.....Truman
Huxley, F. R.....Faribault
Hvoslef, Jacob.....
.....International Falls
Hynes, James.....Minneapolis
Hynes, John E.....Minneapolis

Ide, A. W.....St. Paul
Ikeda, Kano.....Minneapolis
Ingerson, C. A.....St. Paul
Irvine, H. G.....Minneapolis

Jacobs, John C.....Willmar
Jacobs, Minerd F.....Rochester
Jacquot, G. L.....Tyler
Jamieson, Earl....Walnut Grove
Jennings, Mary H....Minneapolis
Jensen, Harry.....Minneapolis
Jensen, J. C.....Hendricks
Jensen, Julius.....Starbuck
Jensen, M. J.....Minneapolis
Jensen, T. J.....Duluth
Jepson, P. W.....Rochester
Jesion, J. W.....St. Paul
Joannides, Minas....Minneapolis
Johnson, A. C.....Rochester
Johnson, A. E.....Minneapolis
Johnson, A. E.....Red Wing
Johnson, A. Elof.....Minneapolis
Johnson, Asa M.....St. Paul
Johnson, C. M.....Dawson
Johnson, Ellsworth.....Windom
Johnson, Hans.....Kerhoven
Johnson, Hartland C.....St. Paul
Johnson, H. M.....Dawson
Johnson, H. P.....Fairmont
Johnson, James A....Minneapolis
Johnson, Julius.....Minneapolis
Johnson, Nimrod A...Minneapolis
Johnson, O. V.....Sebeka
Johnson, R. A.....Minneapolis
Johnson, Ray G.....St. Paul
Johnson, Selmer M...Minneapolis
Johnson, T. H.....St. Paul
Jones, A. W.....Red Wing
Jones, D. C.....St. Paul
Jones, E. M.....St. Paul
Jones, G. M.....Minneapolis
Jones, H. T.....Rochester
Jones, H. W.....Minneapolis
Jones, Richard N.....Richmond
Jones, W. A.....Minneapolis
Josewich, Alexander.....
.....Minneapolis
Josewski, R. J.....Stillwater
Joyce, G. T.....Rochester
Judd, E. S.....Rochester
Judge, Walter T.....Graceville
Juergens, H. M.....Belle Plaine

Juliar, R. O.....St. Clair

Kahala, Arthur.....Crookston
Kalinoff, D.....Stillwater
Kamman, Gordon R.....St. Paul
Kamp, B. A.....Albert Lea
Kannary, E. L.....St. Paul
Kanne, C. W.....Faribault
Karn, B. R.....Ortonville
Kaufman, A. J.....Franklin
Kaufman, Wm. C.....Appleton
Kean, N. D.....Coleraine
Keeling, Louis F.....Lakefield
Keith, N. M.....Rochester
Kelly, B. W.....Aitkin
Kelly, John V.....St. Paul
Kelly, Paul H.....St. Paul
Kelly, Thomas C.....Mankato
Kelsey, C. G.....Hinckley
Kemp, A. F.....Mankato
Kennedy, C. C.....Minneapolis
Kennedy, Jane F.....Minneapolis
Kennedy, Roger L. J.....Rochester
Kennedy, R. Ray.....Minneapolis
Kennedy, W. A.....St. Paul
Kenny, H. F.....St. Paul
Kerlan, S. Z.....Aitkin
Kern, M. J.....St. Cloud
Kernohan, J. W.....Minneapolis
Kesting, Herman.....St. Paul
Keyes, C. R.....Duluth
Keyes, E. D.....Winona
Kibbe, O. A.....Minneapolis
Kiefer, M. A.....Sleepy Eye
Kierland, P. E.....Alexandria
Kilbride, J. S.....Canby
Kilfoy, Edward Joseph.....
Rochester
Kimball, H. H.....Minneapolis
Killins, Wendell A.....Rochester
King, E. A.....Minneapolis
King, W. R.....Minneapolis
King, W. S.....Eveleth
King, Z. P.....St. Paul
Kingsbury, E. M.....Clearwater
Kinsella, T. J.....Minneapolis
Kirchner, Augustus.....Rochester
Kirk, G. P.....East Grand Forks
Kistler, A. S.....St. Paul
Kistler, C. M.....Minneapolis
Kittelson, Olaf.....Minneapolis
Kittelson, T. N.....Fergus Falls
Kjelland, J. S.....
East Ellsworth, Wis.
Klaveness, E.....Monticello
Klein, Harry.....Duluth
Klein, H. N.....St. Paul
Klima, W. W.....Stewart
Knapp, F. N.....Duluth
Knauff, M. K.....St. Paul
Knight, H. L.....Minneapolis
Knight, Ralph T.....Minneapolis
Knight, Ray Roberts.Minneapolis
Knudtson, H. M.....Browerville
Koch, John Charles..Minneapolis
Kohlbry, C. O.....Duluth
Kohler, D. W.....St. Joseph
Kohler, F. G.....Minneapolis
Kohler, G. A.....Minneapolis
Koller, Herman M...Minneapolis
Koller, L. R.....Minneapolis
Kooiker, Herman J..N. Albert Lea
Kraft, Peter.....Duluth
Kremer, Walter J...Minneapolis
Kriedt, Daniel.....Minneapolis
Kucera, Wm. J.....Minneapolis
Kuhlman, Aug.....Melrose
Kusske, A. L.....New Ulm
Kuth, J. R.....Duluth
Kvitrud, G.....Minneapolis

Laird, A. T.....Nopeming
Lajoie, John M.....Minneapolis
Landeen, F. G.....Stillwater
Lane, Laura A.....Minneapolis
Laney, R. L.....Puposky
Langenderfer, F. V.....St. Paul
Langhoff, A. H.....Glencoe
Lannin, J. C.....Mabel
Lapierre, A. P.....Minneapolis
La Pierre, C. A.....Minneapolis
Lapp, Victor Ray.....Rochester
Larsen, C. L.....St. Paul
Larson, A. L.....Fertile
Larson, L. M.....Brainerd
Larson, M. L.....St. Paul
Larson, O. O.....Detroit
Latchford, James Kyran....
.....Rochester
Laurent, A. A.....Minneapolis
La Vake, R. T.....Minneapolis
Law, A. A.....Minneapolis
Lax, Morris H.....St. Paul
Leahy, Bartholomew....St. Paul
Leavenworth, Richard O..St. Paul
Leavitt, H. H.....Minneapolis
Lebowski, Joseph A..Minneapolis
Leck, Clifford C.....Austin
Le Clerc, J. E.....Le Sueur
Lee, H. M.....Minneapolis
Lee, J. L.....Watertown
Lee, W. A.....Fergus Falls
Lee, W. P.....Northfield
Leibold, H. H....Parkers Prairie
Leicht, O.....Winona
Leitch, Archibald.....St. Paul
Leland, John T.....Herman
Leland, M. N.....Minneapolis
Lemon, W. S.....Rochester
Lemstrom, Jarl.....Minneapolis
Leonard, L. J.....Minneapolis
Leopard, B. A.....New Richland
Lepak, F. J.....Duluth
Lepak, John A.....St. Paul
Lerch, William.....St. Paul
Leuty, Amos.....Morris
Lewis, A. J.....Henning
Lewis, C. B.....St. Cloud
Lewis, E. J.....Sauk Center
Lewis, J. B.....S. St. Paul
Lewis, W. W.....St. Paul
Lexa, F. J.....Lonsdale
Libert, John N.....St. Cloud
Lichtenstein, H.....Winona
Lick, C. Louis.....St. Paul
Liedloff, A. G.....Mankato
Lillie, H. I.....Rochester
Lillie, W. I.....Rochester
Lima, Ludvig.....Montevideo
Lind, C. J.....Minneapolis
Lindberg, A. L.....Wheaton
Linde, Herman.....Cyrus
Lindgren, E. I.....Duluth
Lindquist, R. H.....Minneapolis
Lindsay, W. V.....Winona
Lindsey, Maude L.....Rochester
Linner, H. P.....Minneapolis
Linton, W. B.....Rochester
Lippman, Hyman S...Minneapolis
List, Walter E.....Minneapolis
Litchfield, John T....Minneapolis
Litman, Samuel N..Meadowlands
Little, D. W.....Appleton
Little, W. J.....St. Paul
Litzenberg, J. C.....Minneapolis
Lloyd, H. J.....Mankato
Locken, O. E.....Crookston
Logan, A. H.....Rochester
Logan, F. W.....Blue Earth
Logefeil, Rudolph C..Minneapolis
Lommen, P. A.....Austin
Long, Jesse.....Minneapolis
Loomis, E. A.....Minneapolis
Love, Fred A.....Carlos
Lowe, Earl R.....St. Paul
Lowe, Thos.....Pipestone
Luden, Georgine.....Rochester
Luedtke, G. H.....Fairmont
Lum, C. E.....Duluth
Lundgren, A. C.....Minneapolis
Lundholm, A. M.....St. Paul
Lundy, John S.....Rochester
Lyday, Russell Osborne ....
.....Rochester
Lyman, F. V.....Grove City
Lynch, M. J.....Minneapolis
Lyng, John A.....Minneapolis
Lysne, Henry.....Minneapolis

McBeath, Ewing C.....St. Paul
McBroom, D. E.....Faribault
McCann, D. F.....Bemidji
McCarthy, Donald ...Minneapolis
McCarthy, W. J.....Madelia
McCarthy, W. R.....St. Paul
McCartney, James S..Minneapolis
McCarty, P. D.....Babbitt
McClanahan, J. B.....White Bear
McClanahan, T. S.....White Bear
McCloud, C. N.....St. Paul
McComb, C. F.....Duluth
McCoy, Mary.....Duluth
McCrea, James.....Fulda
McDaniel, Orianna..Minneapolis
McDavitt, Thos.....St. Paul
McDonald, A. L.....Duluth
McDowell, J. P.....St. Cloud
McEachran, A.....Minneapolis
McFarland, A. H.....Minneapolis
McGandy, R. F.....Minneapolis
McGeary, Geo. E.....Minneapolis
McGiffert, E. N.....Duluth
McGroarty, J. J.....Easton
McGuigan, H. T.....Red Wing
McHaffie, O. L.....Duluth
McHugh, Roderick F.....Aitkin
McIntire, H. M.....Waseca
McIntyre, E. H.....Virginia
McIntyre, Geo.....Minneapolis
McIntyre, John A.....Owatonna
McKaig, Carle B.....Pine Island
McKeithen, A. M.....Rochester
McKenna, J. K.....Austin
McKeon, James.....St. Paul
McKeon, J. O.....Montgomery
McKeon, Owen.....St. Paul
McKeown, E. G.....Pipestone
McKibben, H. E.....St. Cloud
McKinley, C. A.....Minneapolis
McKinney, F. S.....Minneapolis
McKnight, Roy B.....Rochester
McLaren, Jennette M.....St. Paul
McLaughlin, E. M.....Winona
McMurtry, Walter C.....Virginia
McNevin, C. F.....St. Paul
McPheeters, H. O....Minneapolis
McQuiggan, Mark Ronald...
.....Rochester
McVicar, Chas. S.....Rochester
MacDonald, A. E.....Minneapolis
MacDonald, D. A.....Minneapolis
MacDonald, Irving C..Minneapolis
MacRae, G. A.....Duluth
Mach, Frank B.....Minneapolis
Macnie, J. S.....Minneapolis
Maertz, W. F.....New Prague
Magath, T. B.....Rochester
Magie, W. H.....Duluth
Magney, F. H.....Duluth
Mahle, A. E.....Rochester
Mahwald, A.....Albany
Maland, C. O.....Minneapolis
Maloney, T. J.....St. Paul
Manley, J. R.....Duluth
Mann, A. T.....Minneapolis
Manson, F. M.....Worthington
Marcley, W. J.....Minneapolis
Mariette, Ernest.....Hopkins
Mark, D. B.....Minneapolis
Marsh, Fred Eugene...Rochester
Martineau, J. L.....St. Paul
Masson, D. M.....Rochester
Masson, J. C.....Rochester
Mathews, Justus.....Minneapolis
Mattill, P. M.....Oak Terrace
Maxeiner, Stanley R..Minneapolis
May, W. H.....Minneapolis
Mayfield, A. L.....Rochester
Mayland, M. L.....Faribault
Mayo, C. H.....Rochester
Mayo, W. J.....Rochester
Maytum, Charles K....Rochester
Mead, Marion.....Minneapolis
Meckstroth, C. W.....Brandon
Mee, P. H.....Osseo
Meierding, Wm. A....Springfield
Meilicke, W. A.....Nicollet
Melby, Benedik.Blooming Prairie
Melzer, G. R.....Lyle
Mentzer, Stanley H...Rochester
Merkert, Charles E..Minneapolis
Merkert, G. L.....Minneapolis
Merriman, L. L.....Duluth
Mesker, G. H.....Olivia
Metcalf, F. W.....Fulda
Meyer, A. A.....Melrose
Meyer, E. L.....Minneapolis
Meyer, P. S.....Faribault
Meyerding, E. A.....St. Paul
Meyerding, H. W.....Rochester
Michael, J. C.....Minneapolis
Michelson, H. E.....Minneapolis
Milan, M. Geo.....Warren
Miller, H. A.....Waseca
Miller, V. I.....Mankato
Miller, W. A.....New York Mills
Mills, J. L.....Winnebago City
Millspaugh, J. G.....Little Falls
Mingo, F. E.....Hugo
Mitchell, A. B.....Hector
Mitchell, Frederick.....St. Paul
Mitchell, R. S.....Grand Meadow
Moersch, F. P.....Rochester
Moersch, H. J.....Rochester
Moffatt, A. G.....Howard Lake
Mogilner, S. N.....St. Paul
Moir, Wm. W.....Minneapolis
Molander, H. A.....St. Paul
Moloney, G. R.....Belle Plaine
Monahan, R. H.....Minneapolis
Monroe, P. B.....Soudan
Montgomery, Hamilton.Rochester
Moore, A. B.....Rochester
Moorhead, M. B.....Minneapolis

Morcom, H. W.....Duluth
More, C. W.....Eveleth
Morem, Edwin.....Minneapolis
Moriarity, Cecile R...Minneapolis
Mork, B. O.....Worthington
Morley, G. A.....Crookston
Morris, Francis J.....Prior Lake
Morris, R. Edwin.....St. Paul
Morrison, A. W.....Minneapolis
Morrissey, F. B.....St. Paul
Morrow, Jas. J.....Austin
Morse, M. P.....LeRoy
Morsman, L. W.....Hibbing
Morss, C. R.....Zumbrota
Mortenson, N. G.....St. Paul
Morton, Chas. Bruce..Rochester
Moses, Joseph, Jr.....Northfield
Moskovitz, Selic.....St. Paul
Moss, Myer, N.....St. Paul
Moynihan, A. F.....Sauk Center
Moynihan, T. J.....St. Paul
Muhme, Norman Benedict...
.....Rochester
Muller, R. Theo.....St. Paul
Murphy, E. F.....St. Paul
Murphy, F. J.....Minneapolis
Murphy, Leo .....Minneapolis
Murray, D. D.....Duluth
Murray, W. R.....Minneapolis
Mussey, R. D.....Rochester
Myers, J. A.....Minneapolis
Myers, Thos.....St. Paul
Myre, C. R.....Paynesville

Naegeli, Frank.....Fergus Falls
Nagel, G. W.....Rochester
Nannestad, J. R.....Albert Lea
Nass, H. A.....Mabel
Nathanson, M. H.....Minneapolis
Nauth, W. W.....Winona
Neal, J. M.....Minneapolis
Neher, F. H.....St. Paul
Nelson, C. P.....Owatonna
Nelson, E. H.....Chisholm
Nelson, H. E.....Crookston
Nelson, H. S.....Minneapolis
Nelson, L. A.....St. Paul
Nelson, Marque O.....Rochester
Nelson, M. S.....Granite Falls
Nelson, Nesmuth .....Brainerd
Nelson, O. E.....Minneapolis
Nelson, O. N.....Battle Lake
Nerad, Anton H.....Argyle
Nesbit, Harold T.....St. Paul
Neumann, C. A.....Lewiston
Neumann, W. H.....Sheboygan
New, G. B.....Rochester
Newhart, Horace ....Minneapolis
Newman, G. A.....Stillwater
Nichols, A. E.....St. Paul
Nicholson, M. A.....Duluth
Nickel, Allen A. C.....Rochester
Nippert, H. T.....St. Paul
Nippert, L. A.....Minneapolis
Nissen, Henrik.....Minneapolis
Nixon, Samuel H.....Minneapolis
Noonan, Dan F.....Minneapolis
Noran, A. N.....Minneapolis
Nordin, C. G.....St. Paul
Nordin, G. T.....Minneapolis
Nordland, Martin....Minneapolis
Norman, J. F.....Crookston
Norrgard, H. T.....Milaca
Norris, Edgar H.....St. Paul
Norris, J. F.....St. Peter
Norris, G. H.....Annandale
Noth, H. W.....Minneapolis
Nusbaum, D. H..Storm Lake, Ia.
Nye, Katherine A.....St. Paul
Nye, Lillian L.....St. Paul

O'Brien, H. J.....St. Paul
O'Connor, I. A.....St. Paul
O'Connor, J. P.....St. Paul
O'Donnell, D. M.....Ortonville
O'Donnell, J. E.....Minneapolis
O'Hara, J. J.....Janesville
O'Leary, P. A.....Rochester
Oberg, C. M.....Minneapolis
Ocksenhirt, Norman C..Rochester
Oerting, Harry.....St. Paul
Offutt, Susan R.....Rochester
Ogden, Warner.....St. Paul
Ohage, Justus.....St. Paul
Ohage, Justus, Jr.....St. Paul
Ohlinger, L. B.....Minneapolis
Ohnstad, J. L.....McIntosh
Oliver, C. I.....Graceville
Olson, Albert E.....Duluth
Olson, Chas. A.....St. Paul
Olson, Chester J.....Belle Plaine
Olson, Ernest A.....Pine Island
Olson, F. A.....Minneapolis
Olson, G. M.....Minneapolis
Olson, Olaf A.....Minneapolis
Olson, R. G.....Minneapolis
Omohundro, Miles Parker...
.....Rochester
Onsgard, C. K.....Halstad
Onsgard, L. K.....Houston
Opheim, O. V....Philadelphia, Pa.
Oppegaard, C. L.....Crookston
Oppegaard, M. O.....Crookston
Oredson, O. A.....Duluth
Ortman, John Wessel.....Pierz
Osborn, Lida.....Mankato
Osburn, B. F.....
.....International Falls
Ostergren, E. W.....St. Paul
Otto, H. C.....Frazee
Overend, H. V.....Hallock
Owre, Oscar.....Minneapolis

Palmer, C. F.....Albert Lea
Palmer, W. L.....Albert Lea
Paradine, J.....Duluth
Pardee, Katherine .....
.....Northampton, Mass.
Parker, B. R.....Rochester
Parker, J. William....Rochester
Parker, O. W.....Ely
Parker, Stephen Thomas....
.....Rochester
Parks, A. H.....Minneapolis
Parson, L. R.....Elbow Lake
Passer, A. A.....Olivia
Patterson, W. E.....Minneapolis
Patterson, W. E.....Westbrook
Patterson, W. L.....Fergus Falls
Paulsen, E. L.....Minneapolis
Paulson, C. W.....North Branch
Paulson, T. S.....Fergus Falls
Payette, C. H.....Duluth
Pearce, N. O.....Minneapolis
Pearsen, William T.....Russell
Pearson, F. R.....St. Paul
Pedersen, A. H.....St. Paul
Pederson, Harold....Minneapolis
Pederson, O. J.....Hanska
Pederson, R. M.....Minneapolis
Pemberton, J. deJ.....Rochester
Penhall, F. W.....Morton
Pennie, D. F.....Duluth
Peppard, T. A.....Minneapolis
Perry, C. G.....St. Paul
Perry, Ralph St. John.....
.....Minneapolis
Peters, R. M.....Minneapolis
Petersen, Thorvald ..Minneapolis
Peterson, A. A.....Mora
Peterson, Alfred.....Dassel
Peterson, Christian....Owatonna
Peterson, H. E.....Granite Falls
Peterson, O. H.....Minneapolis
Peterson, O. L.....Cokato
Peterson, R. A.....Vesta
Peterson, V. N.....St. Paul
Peterson, Willard C..Minneapolis
Pettit, C. W.....Minneapolis
Peyton, Wm. T.....Minneapolis
Pfaff, E. K.....Shoals, Ind.
Phelps, Kenneth A...Minneapolis
Phillips, A. E.....Delano
Pierce, Chas. H.....Wadena
Pierson, Claude M.....Wheaton
Pilon, P. C.....Paynesville
Pineo, W. B.....Minneapolis
Piper, M. C.....Rochester
Piper, Wm. A....Mountain Lake
Plankers, A. G.....Rochester
Platou, E. S.....Minneapolis
Plondke, F. J.....St. Paul
Plonske, C. J.....Faribault
Plummer, H. S.....Rochester
Plummer, W. A.....Rochester
Poehler, F. T.....Minneapolis
Poirier, J. A.....Forest Lake
Pollock, L. W.....Rochester
Poppe, Fred H.....Minneapolis
Powell, L. D.....Rochester
Power, J. E.....Duluth
Powers, F. W.....Barrett
Prangen, A. D.....Rochester
Pratt, Fred J.....Minneapolis
Pratt, J. A.....Minneapolis
Preine, I. A.....Minneapolis
Prickman, Louis Elwood....
.....Rochester
Prim, J. A.....Minneapolis
Pritchard, D. B.....Winona
Proshek, Charles E..Minneapolis
Puffer, F. L.....Bird Island
Pugliese, Frank M.....Rochester

Quigley, T. C.....Owatonna
Quinby, Thomas F...Minneapolis
Quist, H. W.....Minneapolis

Raadquist, C. S.....Hibbing
Radabaugh, R. C.....Hastings
Radtke, H. P.....Chisholm
Rains, J. M.....Willmar
Raiter, Franklin W. S....Cloquet
Raiter, Roy F.....Cloquet
Ramsey, W. R.....St. Paul
Randall, Lawrence Merrill...
.....Rochester
Ransom, L. M.....Hancock
Ratcliffe, J. J.....Aitkin
Rathbun, A. M.....Rice
Rathbun, C. A.....St. Cloud
Reed, Chas. A.....Minneapolis
Rees, S. P.....Minneapolis
Reeve, E. T.....Elbow Lake
Reeves, C. E.....Eagle Bend
Regnier, E. A.....Minneapolis
Reid, J. Spence.....Rochester
Reineke, George F.....New Ulm
Reiter, H. W.....Shakopee
Replogle, W. H.....Wabasha
Reynolds, J. S.....Minneapolis
Rhines, D. C.....Caledonia
Rice, G. D.....St. Cloud
Richards, E. T. F.....St. Paul
Richards, W. B.....St. Cloud
Richardson, Fred S.....Belgrade
Richardson, Harold E...St. Paul
Richardson, W. E.....Pipestone
Richardson, W. J.....Fairmont
Richdorf, L. F.....Minneapolis
Ridgeway, Alexander.Greenwald
Ridgway, A. M.....Annandale
Riggs, C. E.....St. Paul
Rigler, Leo G.....Minneapolis
Rippert, J. A.....Duluth
Rishmiller, J. H.....Minneapolis
Risjord, J. M.....Fertile
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Ritchie, H. P.....St. Paul
Rivers, A. B.....Rochester
Roadman, I. M.....Ponsford
Roan, Carl M.....Minneapolis
Robb, Edwin F.....Minneapolis
Robbins, C. P.....Winona
Roberts, L. M.....Little Falls
Roberts, Thos. S.....Minneapolis
Roberts, W. B.....Minneapolis
Robertson, H. E.....Rochester
Robertson, J. B.....Cottonwood
Robertson, P. A.....Austin
Robilliard, C. M.....Faribault
Robilliard, W. H.....Faribault
Robinson, J. M.....Duluth
Robitshek, E. C.....Minneapolis
Rothford, W. E.....Minneapolis
Rodda, F. C.....Minneapolis
Rodgers, C. L.....Minneapolis
Roehlke, A. B.....Elk River
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Rohwer, Christian Jacob....
.....Rochester
Rollins, F. H.....Saint Charles
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Schaaf, F. H. K.....Minneapolis
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Schatz, F. J.....St. Cloud
Schefcik, J. F.....Minneapolis
Scheldrup, N. H.....Minneapolis
Scherer, C. A.....Duluth
Schlesselman, J. T.....Mankato
Schlutz, Fred W.....Minneapolis
Schmidt, P. A.....Good Thunder
Schmidt, W. R.....Glencoe
Schmitt, A. F.....Minneapolis
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Schmitt, S. C.....Minneapolis
Schnanenberger, G..Rollingstone
Schneider, H. A.....Jordan
Schneider, J. P.....Minneapolis
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Schoch, R. B.....St. Paul
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Schons, E.....St. Paul
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Schroeder, C. H.....Duluth
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Schultz, J. A.....Albert Lea
Schulz, Irwin.....Rochester
Schulze, Albert G.....St. Paul
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Schwartz, Virgil J...Minneapolis
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Schwyzer, Gustav ...Minneapolis
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Seashore, Gilbert....Minneapolis
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Stewart, C. A.....Minneapolis
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Strachauer, A. C.....Minneapolis
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Stratte, A. K.....Pine City
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Strickler, May.....Sleepy Eye
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Thomas, Geo. H.....Minneapolis
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Turnbull, Robert.....Fosston
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Tyrrell, C. C.....Minneapolis

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Van de Steeg, Wm. G....Biwabik
Van Slyke, Chas. A.....St. Paul
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Vogtel, Melvin A....Minneapolis
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Von Berg, J. P.....Albert Lea
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Vonder Weyer, Wm.....St. Paul
Vrooman, F. E.....St. Francis

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Waller, Jas. D.....Wilmont
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.....Battle Creek, Mich.
Walters, H. W.....Rochester
Wanous, E. Z.....Minneapolis
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Warner, E. F.....St. Paul
Warnock, R. W.....St. Paul
Warren, C. L.....Le Roy
Warren, E. L.....St. Paul
Warren, F. S.....Faribault
Warren, J. W.....Faribault
Warwick, Margaret .....St. Paul
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Watson, John D.....Holdingford
Watson, N. M....Red Lake Falls
Wattam, G. S.....Warren

Way, O. F.....Claremont
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Weber, M. L.....Duluth
Webster, H. E.....Duluth
Weir, J. D.....Beardsley
Weir, J. F.....Rochester
Weiser, Geo.....New Ulm
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Welles, H. J.....Minneapolis
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Werner, O. S.....St. Hilaire
Westerman, F. C....Montgomery
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Wilcox, Archa E.....Minneapolis
Wilcox, M. Russell..Minneapolis
Wilder, R. M.....Rochester
Wilkinson, Henry Fielding..
.....Rochester
Wilkinson, Stella.....Duluth
Will, W. W.....Bertha
Willcutt, Clarence...Minneapolis
Williams, Clayton.....St. Paul
Williams, L. A.....Slayton
Williams, Robert....Minneapolis
Williams, R. J.....Pine River
Williams, R. V.....Rushford
Williamson, Carl S.....Rochester
Willius, F. A.....Rochester
Willson, Hugh S.....Minneapolis
Wilmot, H. E.....Litchfield
Wilson, C. E.....Blue Earth
Wilson, L. B.....Rochester
Wilson, R. H.....Harmony
Wilson, Warren.....Northfield
Wilson, W. E.....Northfield
Wilson, W. F.....Lake City
Wiltrout, I. Geo.....Oslo
Winberg, O. K.....Lake Park
Winnick, J. B.....St. Paul
Winter, J. A.....Duluth
Wiseman, R. L.....Pine City
Witham, C. A.....Minneapolis
Wittich, F. W.....Minneapolis
Wohlrabe, A. A.....Minneapolis
Wold, K. C.....St. Paul
Wolfe, H. H.....St. Paul
Woltman, H. W.....Rochester
Wood, Douglas F....Minneapolis
Wood, H. G.....St. Paul
Woodard, F. R.....Minneapolis
Woodruff, C. W.....Chatfield
Woodworth, Elizabeth .....
.....Minneapolis
Workman, H. M.....Tracy
Workman, W. G.....Tracy
Wray, W. E.....Campbell
Wright, C. B.....Minneapolis
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Wright, C. O.....Luverne
Wright, Franklin R..Minneapolis
Wynne, H. M. N.....Minneapolis

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Young, V. A.....Duluth

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THE DYNAMICS OF PERSONALITY*

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The most dramatic sentence, perhaps in all medical literature, was that uttered by Virchow, the great German pathologist — "Everything from a cell." Previous to this it had been supposed that the body functioned as a whole—whatever that meant. It had never dawned upon the minds of medical men that the body was a commonwealth of countless millions of cells—vital units bound together in a harmoniously working whole. The old physiologist, Flourens, taught that the brain functioned as a whole, little realizing the wonderful discoveries later to be made by Ferrier, Horsley and their confrères, that it possessed specialized centers with specialized functions, which worked together in such perfect unity and harmony as if they were a single cell.

Some have estimated that in the human organism there are 26,500,000,000 cells; that in the central nervous system there are three thousand million cells and that in the brain cortex, which is one-ninth of an inch in thickness, there are twelve hundred million cells. In this great commonwealth of cells are to be found those whose function is very simple, and between these and the most complex and highly specialized—the last evolved—the nerve cell, there is every possible degree of difference. The old physiologies used to teach that body tissue changed every seven years. We know enough about physical activities and chemical reactions to know that this change takes place with much greater rapidity. How much greater is not definitely known. Without doubt the tissue that goes to make up our brain cells has been replaced very frequently during our lifetime. The marvelous thing is that the impressions that were made many years ago, notwithstanding this constant change in the cell structure, are distinct and as clear-cut as those made more recently. This is a perpetual miracle.

In this human organism—this commonwealth of cells—there are 200 bones, 230 joints, 260 pairs of muscles. In the biceps muscle, there are 600,000 fibers; three hundred muscles are involved in the act of walking. The body is 75 per cent water. The red blood cells are small discs which give to the blood its color; they are the oxygen carriers and the coloring matter is due to their hemoglobin content; this contains the iron. Each molecule† of hemoglobin contains something like 2,000 atoms of iron. The iron of the blood is in very small quantities and can be truly called a precious metal. There are about fourteen pints of blood in the human body. If one exercises energetically, this passes through the heart and completes a circuit of the body in ten seconds. It is estimated that the heart of a person seventy years of age has pumped blood into his arteries 2,500,000,000 times. There are certain cells in the organism which possess specific functions. They may be called the genii or wonder-workers of the body. These specialized cells, with their specific activities, are known as the ductless glands because they discharge their chemical messengers or hormones directly into the blood. In its stream they travel along until they reach the points where their activities manifest themselves, and it is due to their work that the body-building is completed and its various functions are initiated, established and perfected. Certain of the hormones of these glands have been discovered. Dr. Charles Mayo told me that a ton of thyroids was required before the active principle of this gland was discovered. It is also said that after this hormone was made synthetically Dr. Kendall forgot the formula and that he spent eighteen months in further investigations before he rediscovered it. Insulin, the hormone of the pancreas, is one of the greatest discoveries of the past twenty-five years. In the near future, the hormones of the remaining glands will undoubtedly be found and the physi-

*Read before the Minnesota Academy of Medicine, October, 1925.

†The Outline of Science, Thomson, vol. 2, p. 330.

cian of the future, knowing as he then will the part they play in the human organism, will be able, by supplying the deficient hormones, to eliminate many diseases and will undoubtedly greatly prolong human life. Death will then be a euthenasia.

These 26,500,000,000 cells constitute a machine the like of which never has been constructed by human hands. It is a self-building, a self-stoking, a self-repairing, a self-regulating machine. It is a remarkable and unique automatic mechanism surpassing anything of the kind in the universe (Thompson). It manifests certain marvelous phenomena such as thought, reason, judgment, volition, will, hope, love—which no chemical reactions or physical activities can explain. Waterston, a distinguished physicist of the last century, states that no bodily reaction can explain human or organic conduct.

Personality is the sum of the activities of this commonwealth of cells. The dynamics of personality are this aggregation of cells, the elemental instincts and acquired experiences—the mental and spiritual flowering of the organism. Personality is the product of these multitudinous influences of their currents and counter-currents. "The least attractive personality is more unfathomable than the whole material universe. Matter itself is a great mystery, but when it embodies mind and mind functions through matter, there springs into being the masterpiece of creation." Tradition, the home, the school, the church, the social order, play their part in its evolution. It is a continuous development—broadening—widening—enriching as the years go by. "It is the net resultant of all our yesterdays."

"Build Thee more stately mansions, oh my soul,
As the swift seasons roll;
Lift Thy low vaulted past;
Let each new temple nobler than the last,
Shut Thee from Heaven with a dome more vast,
Till Thou at length art free,
Leaving Thine outgrown shell by life's unresting sea!"

The evolution of the nervous system most vital for this study occurs during childhood, pubescence and adolescence. At the seventh year, the brain has approximately attained its weight—the most rapid growth being between the first and fourth years. Of the three thousand million cells in the central nervous system, it is in those of the brain itself that our interest particularly centers. The newborn child is an automaton. The nerve centers necessary to life predominate in function. Following life's ageless patterns, the dendrites and axis cylinders grope their way along their predestined paths until the eighteenth year, when the marvelous artistry of the nervous mechanism is achieved. Of these countless millions of brain cells each has found its anatomic relationship and infinite complexity has become amazing simplicity—functioning as a single unit.

"Trailing clouds of glory do we come
From God who is our home."

If heredity, trauma or infection does not mar, a perfected machine is the end-result. An instance of this is seen in Laura Bridgman, the blind, deaf mute, in whom in these specialized localities normal development ceased at the end of the second year (Donaldson). Having anatomically arrived, during the second seven years of life, the brain, physiologically speaking, has to find itself; nerve courses have to be charted, nerve currents have to find their appointed channels in order that normal functioning may be established. Clearly, pubescence and adolescence play a major part at this period of development when nature's supreme effort is to achieve anatomically and physiologically a finished mechanism. This is personality's testing time. For this crucial moment, heredity waits, and through life's web and woof its shuttle finds the way. "Every man," says Oliver Wendell Holmes, "is an omnibus in which all his ancestors are seated."

Many hereditarians manifest an evangelistic zeal, a faulty logic, a crude reasoning and an unjustified dogmatism not in accord with the scientific spirit. Of this the notorious Kalikak family is an instance. Martin Kalikak conferred a despicable immortality on a feeble-minded young girl. Since morons possess the instincts of an adult and the self-control of a child, why not other Martin Kalikaks? Therefore, the paternity of the offspring of this girl cannot be positively established. She was a *nameless*, feeble-minded girl. Diagnosis cannot be based on tradition and hearsay. "Breeding the human being," says Myerson, "is still an unknown science and nowhere in life does it run so true to form as depicted in the history of the Kalikaks."

In his book, "Social Control of the Feebleminded," Stanley P. Davies says, "We can be certain of

only one thing at present with regard to the mode of transmission of hereditary mental defects, and that is of our uncertainty. In other words, the existing state of knowledge on the subject permits of reaching no final conclusions. It merely indicates the importance of much further study and investigation. At the same time it is clear that the apparently final conclusions expressed some years back are no longer tenable."

Read that remarkable little book, "Prometheus or Biology and the Advancement of Man," by Professor Herbert Spencer Jennings of Johns Hopkins University. It scraps the term "inheritance." Professor Jennings' conclusion is that so long as biparental reproduction remains—

"Capitalists will continue to produce artists, poets, socialists and laborers; laboring men will give birth to capitalists, to philosophers, to men of science; fools will produce wise men and wise men will produce fools; who mounts will fall, who falls will mount; and all the kinds of problems presented to society by the turns of the invisible wheel will remain."

Why always stress the Kalikaks, the Jukes and the like; why not emphasize Jonathan Edwards and his 1,394 descendants—not a criminal or feeble-minded person among them. Cecil, in England, is an honored name. Robert Cecil was Governing Minister in the sixteenth century. In the nineteenth century, a Robert Cecil occupied the same honorable position. For two generations the Pitt family was perhaps the most distinguished in the political history of England. Undying words were those of the elder Pitt, "If I were an American as I am an Englishman, while a foreign troop was landed in my country, I would never lay down my arms —never, never, never." These are notable instances of a normal heredity and show that germ plasm may indefinitely preserve its virility.

"There are only two diseases, genetically speaking, namely, color blindness and hemophilia," says Stockard, "that are inherited and possess clear-cut mendelian characters."

As far as human matings go, the mendelian theory has not been sufficiently tested. The late Dr. Omerod and Sir Bryan Donkin have pointed out that there are too many complicating factors to permit mendelian principles, which are so striking in animals where breeding can be controlled, to be applied in relation to mental diseases (Mott). Its acceptance with our present knowledge is unscientific and leads to false and absurd conclusions. It is entirely probable that there are many inheritable diseases in which there is transmission of the germ plasm from one generation to another (Stockard), but this remains to be genetically proved. The too general assumption that heredity plays an inevitable part is a fatalistic doctrine that discourages investigation and ends progress. If, on the other hand, we say "that environment in some of its forms, as toxin, infection and lowering of vitality acts in a blastophoric way we are stirred to research and study" (Myerson). "We talk about the 'ids' and the 'genes' so glibly and so heatedly at times," says Barker, "that an occasional dash of cold water from the rigid experimentalist can scarcely fail to be salutary." The same writer states that "one must distinguish between inheritance of disease and the inheritance of tendency. The germ plasm represents a disposition to disease. The actual disease is the result of a reaction between what was in germ plasm and its environment; hereditary disease is probably dependent to an extent for its manifestations upon the environment of the developing organism." Environment is a definite force to be reckoned with; Weisman and Mendel are mountain peak men, but their views have been greatly overstressed. Hysteria, neurasthenia and psychasthenia are clinical syndromes, not diseases—are varied expressions of personality in varying stages of dissociation, due to trauma, infections and emotional strain. So-called neuropathic and psychopathic tendencies are probably blastophoric abnormalities not transmissible for more than one generation; they are evidences of a constitutional vulnerability—as determining influences in maladjustment they have been greatly overexaggerated. Searching for them as evidence of heredity is as futile as following the will-o'-the-wisp. Insanity is a meaningless term—mental disease is the proper appellation. "It is very necessary to recognize," says Mott, "that the germ cells of every person who is certified as insane and sent to a mental hospital are not necessarily potential transmitters of a mental disease." "It has been reliably estimated that of the 7,000 infants born each day in the United States, about 270 or one in twenty-six eventually become incapacitated by abnormalities of the mind" (Strecker and Ebaugh).

In psychiatry, there are two defects which can probably be called unitary—that can be transmitted from generation to generation. These are de-

mentia præcox and the manic-depressive psychoses. The other forms of mental symptoms in disease are basically somatic, as observed in a great variety of bodily affections. Paresis, although characterized by a great variety of mental symptoms, is not a mental disease. The mental phase appears in the course of a luetic infection. To use the precise words of Dr. Hugo Richter, it is a spirochetosis of the cerebral cortex. Epilepsy can no longer be regarded as hereditary; it also is a syndrome, not a disease. Essential epilepsy is not a disruptive cortical discharge, as we used to believe—a concept endeared by the years; this theory is no longer tenable. Tumor, syphilis, cerebral arteriosclerosis, trauma, toxic states are well known factors. In essential epilepsy we are dealing with definite but unknown factors. Researches in decerebration have taught us that it is a dropping out of the cerebrum from activity and the unleashing of lower motor centers—probably the mid-brain (Myerson).

Certain forms of feeble-mindedness seem to possess a unitary character and are probably germ plasm defects, but the proportion of such families to the mass of the feeble-minded is comparatively small. Environmental and prenatal influences, infections and trauma are the predetermining causes, the effects of which are probably not handed down. My contention is that as medical men we know too little about heredity to formulate theories or determine therapy. To being foreordained and predetermined as is now so popular, I object. *Heredity tells us the source of our talents but it does not leave us helpless in the grip of ancestral tendency.*

Pubescence is an epochal moment. Hitherto, the normal child has shown no definitely differentiated masculine or feminine characteristics aside from those arising from environmental conditions. Life, thus far, has been as carefree as a holiday. Each moment a feeling of joy, no anxieties to mar, no serious responsibilities to depress. The relation between the boy and the girl has been one of good fellowship—a pleasant camaraderie. Then a subtle, insidious, startling change—the hormones have begun their predestined task—male and female traits become definite and apparent. Something intangible separates them; this they dimly perceive, but fail to understand. The boy is conscious of a feeling to please, to appear to the best advantage; pimples humiliate him; slovenliness he avoids. He is crudely chivalrous, mildly patronizing. This is the particular time in the life of the male, when the inferiority complex feebly and precariously functions. The girl, no longer audacious, becomes diffident and retiring. To the tomboy the strenuous life no longer appeals—a new shyness, gentleness and thoughtfulness enhance personality with a compelling graciousness; idealism, hopefulness and a capacity for self-sacrifice are outstanding traits. To youth has come an enthralling vision; its soul quivers with vague yearning and inarticulate desires. Dimly it perceives that it is a link in Nature's chain of infinite purpose; it is the custodian of a deathless heritage—the germ cell.

Our mental faculties develop in a gradually orderly manner. The capacity to reason is not attained before the twelfth year (Goddard). Imagination does not come into its own until the fourteenth year. It is during the evolution of the mental powers that the brain is flooded with countless impressions through the senses. Home, school, church and social order pour into it an overwhelming tide of ideas, new, strange and of infinite variety. The amazing thing is that the mind out of this chaos can bring forth cosmos.

As we study the developmental process, the one dominating thought is that life is a continuous conflict, "a biological and spiritual venture," for youth and adult alike; both travel the same road; one's journey ends a little sooner than the other. The vital unit in this great adventure is the home. Too frequently it is not realized that each member of the family has a different rhythm; youth is the period of rapidly changing moods. Living together is an art. The girl or boy should be treated with kindliness, not harshness; handicaps of mind and body need great consideration; impulses and instinctive tendencies should be carefully guided; the ethical and social nature should be developed. Bad behavior and anti-social conduct frequently seen in youth arise from various causes, notably, mental conflict, the sex instinct, changes in the ductless glands and the inferiority complex. Jealousy, hypocrisy and antagonism between parents may give rise to mental retardation and delinquency. It has been demonstrated that when an emotional conflict has been relieved in a child the intelligence quotient may run up thirty or forty points in three months (Mrs. Wooley). The average child, with reasonable care, will develop a normal personality. Childhood has four outstanding characteristics—suggestibility, plasticity, imi-

tativeness and love of approbation. Because of these fundamentals, Thom established a habit-clinic for children in the pre-school age. By virtue of their plasticity, their personalities can be moulded and remoulded and healthy habits ingrained. Suggestibility and imitativeness possess the magic qualities of a fairy's wand. Disregarding the 15 to 20 per cent of abnormals—feeble-minded, epileptic, neurotic and those manifesting endocrinic disturbances—which surveys of school children have shown to exist, parents hold their child's future absolutely in their hands. In childhood, "the pattern of human reaction is formed." Dr. Barnard Glueck regards behavior as a dynamic process—a series of events following a certain series of causes—that the early years are the most determining, the most important years of life and that the greatest potential influence in the development process is human environment—particularly that of the home. The family today is and ever has been in flux; constantly it is readjusting itself to the ever-varying human needs.

The maladjustments that mar life usually occur in the development period; those not arising from disease are due largely to fault in the home—to parental neglect. Because the home failed in this evolutionary crisis, the state had to intervene and "assume duties which the parents were unable or unwilling to fulfill"; to meet a grave crisis the juvenile court was established. The attitude of the court toward the delinquent is that of a wise parent toward an erring child. * * * "Too many people," says President Coolidge, "are neglecting the real well-being of their children, shifting the responsibility for their actions and turning over supervision of their discipline and conduct to the juvenile courts. A very large proportion of the outcasts and criminals come from the ranks of those who lost the advantages of normal parental control in their youth. They are the refugees from broken homes, who were denied the necessary benefits of parental love and direction. What the youth of the country needs is not more public control, through Government action, but more home control through parental action." Judge Nott of the Court of General Sessions, New York City, in a recent Scribner's Magazine, says, "No word nowadays is really more abhorrent to the American people than the word 'discipline.' They hate to subject their children to it,—they hate to submit to it themselves or inflict it upon lawbreakers. * * * They seem to regard 'discipline' and 'cruelty' as synonymous words."

Civilizations rise and fall every 1,000 or 2,000 years. American civilization is traveling the same road. The same causes of decay are in evidence today—neglect of the child, greed for wealth, power, luxury, unwillingness to work and serve, living for pleasure and the gratification of sense. In my youth, delinquency was practically unknown. Incorrigibles there were, but of such rarity as to create for themselves an unenviable notoriety. The automobile, the movies, the home—two rooms and a kitchenette—are all disintegrating factors, but greater far is the lack of interest on the part of the father and an irritable, unsympathetic and pleasure-mad mother. "Home," says an American Juvenal, "is a place where if you have to go they will take you in." Self-determination, so false and detrimental to the best interest of the child, disrupts the healthy home life. Nothing could be more absurd than that a boy or a girl passing through the crucible of evolution, subject to the sweep of elemental forces, inexperienced, judgment immature, self-control unstable, should be expected or permitted, unadvised, to pilot their ship on what is to them an uncharted sea. The earliest and basic feature of this dry rot in the American home is failure to appreciate ethical and spiritual values—biological necessities. Without these elemental verities no home can exist. Morality is imperative; immorality idiocy. The failure of parents to find the child's level, incapable therefore to understand his problem, is greatly to be deprecated. This viewpoint of vision, only parental love can attain. The behavior of the child in the home reminds one of the pain and muscle spasm in appendicitis—a mechanism of defense.

There have been two destructive forces the last few years that have been a peril to the developing child and a menace to the home. I was taking a walk recently when a little treble voice commanded me, at the point of a toy pistol, to put up my hands and be snappy about it, an example of the educational character of the present-day movie. Children are pre-eminently suggestible and they have no inner censor to enable them to distinguish between the false and the real. What can society expect of children whose convictions and ideals are movie-born? Freudian philosophy has poisoned our morals, placed false emphasis on sex, undermined the home and dethroned God—a dying cult, but

a devastating force. Thus, Nature reaches her goal —the attainment of adolescence, in the commonwealth of cells that constitute the human organism; we have seen the gradual unfolding of personality, and in its evolution we have beheld the travail of a human soul.

The middle years bring their definite and distinctive stress. Involution is the second great epoch in the making of personality. The life impulse gradually wanes and the forces of disintegration begin their predetermined task. Hereditary tendencies, ofttimes quiescent in the developmental period, now awaken into activity. The manic-depressive psychosis and the dementia precox syndrome are an ever-present menace. Involution is a normal physiological process—it is the reaction of personality to definite biological and environmental conditions that constitutes the peril of the middle years; it is Nature's readjustment period of the organism. Changes in the ductless glands tend to nervous instability; overeating and lack of exercise open Pandora's box and the degenerative diseases which cause an alarming mortality spring forth. The middle years are also a testing time of personality. The restraints of the childhood home, the influence of parents long since dead, brothers and sisters scattered, constitute a waning force. Not only may physical efficiency be impaired but in addition to this organic stress there is great perturbation in the psychic sphere due to unhappy marriages, disappointment in children, the loss of the ideals and aspirations of the early years and embitterment because hopes and ambitions have fallen so far below actual accomplishments. The outstanding dynamic at this time is the home, children and friends—a sustaining and stabilizing power. The serpent in this paradise is a neglect to cultivate and be responsive to the imperative ought. Into the subconscious, the wayward wish gains entrance, which purposeful phantasy kindles into flame until the growing complex dominates all control; integrity, probity and a stainless past are often lost in the current of resistless desire. The delinquencies of "the riotous forties" arise not from caprice or lawless impulse, but are due to the harboring of the antisocial thought in the subconscious whose activities determine the issues of life—a glorious consummation or an ignoble defeat.

Old age is the final epoch in the life cycle. It is inevitable; one can honor and dignify it, but cannot escape it. Many are born old; some old are young; one has said, "At forty, old age is in its infancy; the fifties are its boyhood and girlhood; the sixties its youth; and at seventy it attains its majority." The Greek language possesses great flexibility of expression. "Bios" means both life and death—a subtle suggestion that we achieve life through death. When one reaches the sixtieth year, he can be called old; the senium has been reached. At about forty-five years in man and fifty in woman the brain begins to lose weight slowly, and at eighty or past, it has lost four ounces (Dana). Even in the normal senium, where degenerative change has not become pathologic, to be swept aside willy nilly causes a tinge of bitterness—a feeling of injustice that strength and virility should so lack in appreciation and graciousness. "It is only those rarely serene souls," says Myerson, "who reach an elevated resignation." The rarely serene souls, I believe to be the rule rather than the exception. To youth, age is afar off; the joy of life enthralls. Ofttimes it is critical, even harsh —age has had its day; as for death it is an event too remote to interest. Age realizes the inevitable; it revels in the glories that are past; like Allan Seeger, it keeps its rendezvous with death undismayed. Age is life's crown of glory; the past has made possible this culmination of Nature's foreordained purpose. It is man's last opportunity—so have the great souls regarded it. Said Clara Barton to a gathering of friends in her ninetieth year, "My working hours are fourteen out of the twenty-four. It is my duty to work for the good of my kind; while the strength is given me I have no right to lay it down." Conrad wrote his first novel when he was fifty years of age. Gladstone took up Greek in his sixtieth year and was made Premier of England in his eighty-third year. Charles the Fifth summoned Titian to Augsburg to court, to paint portraits when he was seventy years old and he was still painting them when over ninety, dying in his ninety-ninth year. Michelangelo was made architect of St. Peter's in his seventy-second year; he then planned the great dome immortalizing himself and his art. Marion Harland at eighty-eight broke her wrist; unable afterwards to use her pen, she learned typewriting; later, becoming blind, she dictated her articles. She died in her ninety-third year. Of her it is said, "The ardor for study and expression never burned low in her heart." Four years ago, James Bryce

made his masterly address at the Williamstown Conference; he was in his eighty-fourth year. William D. de Morgan was sixty-five years of age when he wrote his first novel. It is said the girls who typed the manuscript were moved to tears and laughter as they did their mechanical work. He died at eighty-seven while working on one of his most interesting stories. Julia Ward Howe, endeared to the American people because of her beautiful poem, "The Battle Hymn of the Republic," wrote the reminiscences of her life when eighty years of age. The founder of the Red Cross, Clara Barton, gave an address in her eighty-ninth year, before six hundred people, standing during its delivery, and after its close, greeted graciously her audience. She died in her ninety-first year, mentality unimpaired. Joshua, the ancient hero, was already old and stricken in years when he received his Lord's message, "There remaineth yet very much land to be possessed." With splendid courage and efficiency he completed the divine commission. The master of modern medicine, Sir William Osler, contracted in October, 1919, a cold, which gave him, as he described it, "a bad knockout." In one of his last letters he wrote, "The confounding thing drags on in an unpleasant way and in one's seventy-first year the harbour is not far off —and such a happy voyage and such dear companions all the way! — and the future does not worry."

Age has its desires, its aims, its ambitions; it is selfless, sagacious, disillusioned. With magnificent courage, it says with Browning:

> "Grow old along with me,
> The best is yet to be,
> The last of life for which the first was made."

STARCH DIGESTANTS

Recent studies of salivary digestion show that 76 per cent of the starch of mashed potatoes and 59 per cent of the starch of bread was converted to maltose, an additional percentage being changed to dextrin. If food is properly masticated and starch digestion allowed to proceed fifteen minutes or so in the stomach, almost as much starch is broken down as when digestion can proceed for a long time. For this the high amylase content of saliva is responsible. The use of amylase preparations in medicine has lost its former vogue. With starch presented in readily digested form, there is little need for salivary digestants—that is, the responsibility for proper digestion of starch is being transferred to the technic of the food factory and the kitchen instead of the purveyor of digestive ferments. (Jour. A. M. A., April 24, 1926, p. 1288.)

A NEW ORIENTATION OF THE PSYCHO-NEUROSES*

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If variety of opinion may be regarded as a sign of progress we are warranted in feeling that progress has been made in our understanding of the multiform phenomena exhibited in the type of cases enrolled under the category of the psycho-neuroses. The conflict of ideas in this field of scientific endeavor may be compared with the confusion of tongues at the Tower of Babel.

The prevalent lay opinion was well expressed by the husband of a nervous patient of mine. In speaking of his wife he used quite glibly the term "hysterical" in a way which aroused our curiosity. After listening to his use of this expression several times we finally asked him to tell us just what he meant by the expression. For a second he seemed embarrassed, became red in the face, made some ineffectual efforts to explain without emitting any sounds, and then said in this way, "Why, hysterical is when a woman wants something and throws a few fits to get it." This lay definition, however far from the truth it may be, has at least the merit of not being ambiguous, and also of recognizing the psychic origin of the condition.

In the medical world our conceptions of hysteria have often not had even this much to recommend them. Among medical men, Charcot was one of the first to direct his studies to hysterical phenomena. Although he assumed a physical basis for hysteria, namely, a change in the neuro-muscular tonus, he laid great weight on the fact that psychic symptoms might be of equal importance with the sensory and motor in the physical sphere. He also emphasized the close relationship of both these series of symptoms, and especially this relationship when it applies to the exciting causes.

The conception of neurotic and hysterical manifestations as due to exhaustion—a fatigue of the nervous mechanisms—has been the predominating one since the days of Charcot and with such authorities as Janet, Beard, Rockwell, and Weir Mitchell, as well as many others. Janet says, "The starting point of hysteria is the same as that of the great neuroses; it is a depression and exhaustion of the

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higher functions of the encephalon." He explains himself further by saying, "All the psychological functions do not present the same difficulty." There are some operations that are easy, first, because they are simple and only require the union of a small number of elements; second, because they are so old—that is, the nervous mechanisms have been conditioned by generations of ancestors to react to these stimuli. Reactions which require so little effort that they take place unconsciously we go through with in an automatic manner. Such reactions are chiefly concerned with the ordinary routine of our daily life. On the other hand, there are functions much more difficult and complex which necessitate, as White says, "the systematization of an infinite number of elements, and above all require a present synthesis." As an illustration of these two types of reaction—we may meet a neighbor, no matter how tired we may be, and go through with the ordinary formalities of a casual greeting in a perfectly satisfactory manner, but if we have to discuss with him some important matter of a complicated nature we shrink from the contact because we realize at that particular time our own inadequacy. The psychic effort required is too great for our nervous fatigue to endure.

This theory of nervous fatigue at first thought seems attractive, and the illustration just given makes apparently quite a satisfactory explanation. It calls up situations which we all find ourselves in repeatedly, and is true as far as it goes, but when one comes to apply it critically as the great underlying causes of psycho-pathology, as we understand this subject now, it becomes woefully inadequate. The illustration just used is that of a perfectly normal reaction and occurs in all of us as the difference in the normal reaction between a state of rest and that of fatigue. It does not account in any degree, for example, for the reactions of a so-called psychopathic individual whose conditioned reactions are paranoid in character as well as also so contracted in consciousness that he is absolutely unable to make contact with reality. Such an individual meets his neighbor with the conditioned state of a prejudice beforehand that the neighbor is seeking to harm him, and all his reactions during the contact between them are the direct result of this delusional condition. The very existence of paranoid delusion without any basis of reality must also presuppose some defective mental capacity. Therefore, something entirely different in character must be found other than fatigue to explain the multifarious psychopathic phenomena which we observe in our nervous and mental patients.

It is just here while we were still clinging to our ideas of fatigue that Freud appears on the scene. White, in his book, "The Foundations of Psychiatry," says, "To begin with perhaps the most important single thing stressed by Freud and his followers has been their deterministic attitude towards psychological facts." No matter what the idea or feeling, it must have an adequate explanation in psychological terms. That is to say, when a patient comes to you complaining about a fear of being alone, which is so intense and persistent that it amounts to an obsession, there is a reason for that fear. Freud says that if a sufficient analysis is made of that patient's life perhaps away back in about their third or fourth year it may be discovered that this patient's parents were in the habit of tucking the patient snugly in his little crib, locking up the house, and either going to the movies or out in their Ford for a joyride. A very attractive reason, but not entirely satisfying. Such a simple explanation of which our patient knew nothing until his past had been unfolded before him by the means of a painstaking examination could scarcely convince us as the reason for the existence of this phobia. We still feel that the old saying, "What we do not know we do not bother about," holds good here as in other things. Granted, however, that we are willing to accept this episode as a cause for this obsession, suppose then we ask ourselves why this phobia only came on this patient at this time. It was twenty-five years ago since his parents owned a Ford. Why did this fear conditioned then, all prepared for delivery, so to speak, lie dormant all the intervening years to arise up before this patient as a terrifying spectre to haunt him at the present time? A logical answer to this question would seem impossible. We are willing to accept without question Freud's application of the old truism of a cause for everything to psychological facts. There is surely a reason for this fear obsession of our patient's, but the reason stated above, or some similar one, does not appeal to us as the real one.

Jelliffe, who perhaps may be called a good Freudian, in discussing in his book, "The Elements of Psycho-Analysis," the relationship of the conscious to the unconscious, says, "The unconscious is to the conscious as a million years is to the present moment," which is only another way of saying that

what the individual himself acquires in conditioned reactions as his very own is exceedingly insignificant to that furnished him, first, by man since the time of Adam, which may be spoken of as phylogenetic in origin, and, second, by his ascendants, which is designated as onto-genetic. If we dig in hard enough in our examination into the family history of this patient with such an obsession we may discover the very interesting fact that the patient's mother and his grandmother before him had a similar fear. The fear in such a case is not an acquired reaction, as the psycho-analyst would make it, depending on some terrifying experience long forgotten, in the life of the patient, buried deep in his unconscious past, but an inherited emotion, a family pattern which, although falling in the psychic sphere, is of much deeper significance than a mere life's episode because it depends upon nervous mechanisms conditioned to this peculiar reaction by long generations of ancestors.

Some time ago we had the opportunity of hearing Professor McDougal of Harvard discuss the Oedipus complex, which has been aptly called the Ark of the Covenant in the Freudian doctrine. You know the Freudians are very fanciful in their choice of phraseology, and in seeking characters to express their thought the period of mythology has been selected as a favorite one with them. It is to this Freudian inclination that Oedipus deserves his present rather undesirable fame. Freud has contributed much to our understanding of complicated nervous phenomena, but almost too much, we feel inclined to say, at least in some directions. The Freudian interpretation of the Greek drama of Oedipus would seem to make Oedipus a sexually abnormal son. The story itself implies no such meaning. The oracle foretells at Oedipus' birth that he is to kill his father and marry his mother. In order to escape such a terrible fate he is left by his parents as an infant on a barren mountain to die. There he is found by a shepherd and taken care of. When he grows up and hears what the oracle has foretold about him he himself tries to forestall the horribly prophecy by leaving his country. The story tells us that in the end what the oracle has foretold about him comes to pass. In an accidental meeting on the highway he encounters his father without having the slightest idea who he is, and in a quarrel he kills him. Afterwards he marries his mother without knowing who she is. When the mother finds out what she has done in her shame she gouges her eyes out, and Oedipus leaves the country feeling forever disgraced. The whole intention of the story appears to be to show how impossible it is to escape the wrath of the gods—to get away from what fate has intended for us. In order to make the truth which he wishes to teach as clear as possible, Sophocles, the author, endeavors to create as impossible and repulsive a situation as he is able to imagine, then give all those concerned in it a warning of the dreadful thing which is to befall them so that they may have every opportunity of avoiding it if such a thing is possible. We see nothing in this story of Oedipus to suggest to any one the sexual import which Freud has given it in his interpretation of the Oedipus complex. This complex is, in short, that for the male infant the mother is the first sexual fixation and for the female the father. This complex is regarded as universal and present during our entire lives. Of course the sexual fixation changes as we go along in life, and in female patients is supposed to involve even the doctor, and on the doctor's involvement depends the whole theory of the doctrine of transference.

Professor McDougal's conclusion concerning the Oedipus complex was that no such feeling has an existence either in infancy or adolescence, in normal persons. We have only to search our own memories of infancy and childhood in an analysis of the love of our mother to agree unanimously with Professor McDougal. The most of us are far along in childhood before we know anything about such a distinction as that of sex. So far as the doctrine of transference is concerned—which is, that the fundamental relationship between the doctor and his patient is a sexual one—it is absurd. We do not see how a normal mind could consider it.

We owe much of value to Freud for the better understanding he has given us of the workings of the psychic mechanisms. We also feel that we have much to hold him responsible for in unloosing in the world such a reprehensible doctrine as the Oedipus complex and the pan-sexualism which he has developed from it. A pleasure-mad world has taken it up and is making use of it as a scientific and respectable explanation for justifying its immoralities.

The Adler theory of organ inferiority is also an attractive one. Adler in explaining what he means by inferior organ says, quoting from White's "The Foundations of Psychiatry" again, that the inferior

organ hangs on to its childlike infantile ways of developing pleasure, if by pleasure the fulfillment of desire in its broadest sense is meant. He uses as an illustration the skin "which in infancy is the avenue through which all sorts of comforting and organically delicious sensations are transmitted to the baby, and therefore in the adult may continue as a source of organic pleasure out of all proportion to the part it should play in a properly balanced picture of the functions of an adult considered in their totality." In Adler's concept of the psycho-neuroses the fundamental element is the feeling of inferiority, which feeling is based on an inferior organ, which, as the case may be, is skin, stomach, abdominal viscera, sexual apparatus, etc. The behavior, then, of the patient depends on an inferiority complex and the reactions of the psychic mechanism represent the methods of the patient for overcoming these feelings. For instance, patients find themselves inadequate to a certain situation. They fight even with themselves against admitting the inferiority complex into their consciousness, and the fight is fiercer when it comes to permitting their environment to realize this inferiority, so to end the conflict in some satisfactory way they establish a compromise. Their method of fixation depends somewhat upon their previous ways of avoiding obstacles. It may be by flight into sickness, such as shell shock, nervous breakdown, a sudden amnesia, or, in case of a railroad accident, what has been variously called railroad spine, traumatic neurosis, compensation neurosis, and latterly in Germany, and what is perhaps the best name of all, "Zwecks Neurosen"—design or purpose neurosis. We asked a shell-shocked soldier in France how long he went to school and found he stopped in the sixth grade simply because he did not want to go any longer. He was either unwilling to do the work, or unable to do what was necessary in order to keep up with his fellows. He would not stop school with this explanation of inferiority even to himself, so he told his parents that his eyes hurt him so much that he was unable to study. Again when at the front in France he would not acknowledge that he was unable to stand the strain which the rest of his comrades were enduring; his way out this time was shell shock—the same psychic mechanism playing over again the same rôle.

Jung, in his conception of the psycho-neuroses, creates what he calls the collective unconscious, an unconscious not only made up of the patient's past but also including family and race as well.

Careful study of these Theories of Freud, Adler, and Jung shows that fundamentally they do not differ so greatly, aside from Freud's conception of pan-sexualism. White, in discussing the chief distinction between the theories of Freud and Jung, says that the former is a drag back, while the latter is a push back, "which is just about the difference between a drag and a push, whatever that may be." It does not seem to us to be such a very great distinction whether the patient is dragged back into regression by the conditioned mechanisms of his unconscious, or is pushed back because of his inferiority to cope with present situations—a difference between tweedledum and tweedledee.

Even though we accept these concepts as the explanation of psycho-pathology, there still remain some questions which require more clarification. How many of the symptoms of the so-called nervous patient are under the control of the will, and how many are beyond his sphere entirely? What symptoms belong to the conscious and what to the unconscious, and how are they related?

The description of a patient now under observation will best illustrate these points. This patient has a depression; he has lost interest in his work, family, current events, etc.; he is unable to concentrate; he cannot eat; he cannot sleep; his mental anguish is great. When we inquire about the cause for this depression we find his mind is fixed on the fear of suicide. This thought has the force behind it of a compulsory idea or impulse. When we ask our patient why he wishes to commit suicide, we receive the rather astonishing answer that he does not, that he wishes to live. The thought of suicide tortures him because he is afraid he might, and so far as his own conscious desires go he wants to live just as much as any of us. In his family history we find that the patient's father did commit suicide. The knowledge of this may have had some influence in the way of suggestion in causing his fear. But on inquiring further it was ascertained that the suicidal impulse was not the only one with which this patient was affected. He has suffered with different kinds of compulsory impulses, among others a homicidal one towards his family. He was as much afraid of this impulse as of the suicidal one, and certainly did not wish to do his family any harm. His disposition

owards them otherwise was a perfectly normal one.

He had another very interesting symptom directly onnected with these thoughts. Whenever they vere present in his mind with the accompanying motional disturbances of fear and depression he omplained of a peculiar burning pain extending rom his forehead down the side of his nose. It s perfectly clear to us that both of these symptoms —the compulsory impulses and the burning pain— vere not in any way under the control of the pa- ient's will. If he had his choice we think he would ave preferred to carry rattlesnakes around in his ockets rather than these thoughts in his brain. In ur opinion both of these symptoms were in no way onditioned by any of the patient's life experiences; hey were conditioned in the nervous mechanisms f his family, doubtless through a series of genera- ions, just as much so as his family features, form, tc., had been conditioned in the process of his fam- ly's evolution. The burning pain down the nose vhich always accompanied these thoughts is of it- elf interesting and instructive. We are not accus- omed to associating physical phenomena with nental content. This is one reason perhaps why ervous symptoms have been so hard to understand. Yet very definite and positive objective symptoms ften occur as a result of emotional complexes. Although these complexes are to greater or lesser legree under the control of the will, these objec- ive symptoms are entirely beyond such control. Often indeed the patient is not conscious of them. An emotional disturbance may be so severe that he patient breaks out in a cold sweat, or faints, r vomits, or even has a severe diarrhea. We must ll admit the objective character of such symptoms. We know also that emotional disturbances in those o disposed may cause a severe headache. Then vhy may we not explain many of the neuralgic ains and various paresthesias, freezings, and burn- ngs, such as our nervous patients complain of, on he same basis? If we will recognize emotional omplexes as causes of the various sensory phe- nomena of which our patients complain we will nelp our understanding of functional nervous con- litions very much.

Another extremely interesting thing in relation to he periodical attacks, or nervous breakdowns, so- alled, of this class of patients is the similarity of one attack to another. If we compare the pres- ent attack with former ones we find they all re- semble each other quite closely. Very often a case of manic-depressive insanity may recognize some time in advance the approach of another attack by the similarity of the sensations to those which he experienced in his former attacks. We all know about the so-called aura or warning of the epilep- tic. It is practically always the same and the epileptic recognizes it and prepares accordingly. The interest here is that we see the same mech- anisms reacting in the same way again and again.

In an experimental study of O. Lowenstein, con- cerning simulation and its relationship to hysteria, some very interesting facts were observed. The author selected thirty-two apparently normal per- sons and suggested to them in various ways that they simulate sickness. In the thirty-two cases there were four who in spite of the fact that sub- jective symptoms were complained of by them seemed unable to express their subjective sensa- tions in any physical manner. All the others, to be sure in different degrees, were found to have physical symptoms. To most of those seeking to pretend illness a tremor of some sort was their choice of expression. Other favorite means of expressing their simulation of sickness were in the forms of anesthesias, hyperesthesias, paralyses, etc. It is worth while to note here that these symptoms are the ones most commonly found in our per- sonal injury cases and those of similar type where method in their madness may be reasonably sus- pected. As the layman said, "They want something and throw a few fits to get it." These simulated symptoms were spoken of as the primary ones and were of course under the control of the will. As a result of the emotional state accompanying the simulation, and this is the most interesting and im- portant observation in this study, certain other symptoms, which were designated as secondary, were noted which were not under the control of the will, and which in some instances the patients were not even conscious of—such symptoms as nystagmus, hyperidrosis, nausea and vomiting, acute diarrhea, reddening of the face, changes of temperature of the hands and feet, temporary ab- sence of the light reaction of the pupils, loss of the superficial reflexes, etc. The author also ob- served in his experiments that the number and severity of the secondary symptoms varied with the degree of intensity with which his test patients entered into the spirit of their simulation. The most important observation from these studies was

the different character of the two classes of symptoms, the primary and secondary—the former entirely simulated, and the latter normal reactions produced by the test person's emotional state and varying with it, but not under the control of the will or even necessarily in the patient's consciousness. These secondary symptoms were considered by the author as the true hysterical or nervous phenomena.

What a flood of light these secondary reactions shed in a clearer understanding of nervous symptomatology in general. Our patients suffer with some emotional strain as a result of which certain reactions depending on the varying tonicity of their nervous mechanisms and their familial reaction patterns take place, such as the burning pain down the nose of the patient previously mentioned and a host of nervous phenomena which, because of their protean nature, could scarcely be enumerated. These phenomena are not under the control of the patient's will or even necessarily in the patient's consciousness.

It is a poor rule which will not work both ways. We have been speaking of symptoms, primary and secondary, and stressing especially the secondary as a result of emotional states. There is a very large class of nervous patients, perhaps the most numerous unfortunately, whose emotional states are entirely caused by the peculiar reactions of their psycho-physical mechanisms. The entire reason for their subjective nervousness lies in the fear and depression induced by their psycho-physical reactions. A description of Mrs. R. will serve as a good example of this large type of nervous cases. Patient is twenty-eight years old. The nervous symptoms of which she now complains began in November, 1924. She was undergoing a rather severe reaction from vaccination when she awakened one night out of a sound sleep and found herself numb all over. No matter where she touched herself she could not feel except on her face and neck. This condition lasted for a few minutes and then passed away completely but left her extremely nervous and apprehensive. However, the next day she tried to treat the matter as a joke. In about two weeks she had another spell apparently different in character, but when one considers it more carefully, quite similar. This time the patient was talking to her daughter when all at once she experienced great difficulty in getting her breath and both her daughter's person and voice were perceived by her as being far away. On close questioning patient says she as a girl had often fainted, especially at her menstrual period, without any apparent cause, and that last winter once while coming out of a skating rink she became dazed for a short time and had no idea for a few minutes where she was. These symptoms come under the category of epileptic phenomena. There is no history of an emotional complex, the attacks simply come and go "out of the blue," as the patient expressed it, perfectly autonomic and always quite similar in type—a normal reaction of an abnormally conditioned nervous mechanism.

As a result of these spells always coming to the patient suddenly and unexpectedly, presenting such startling phenomena to her, her life has become one of continual fear and dread. She is much depressed and does not care to live if she has to go on in this way. In this type of case, which is the type of many, unfortunately, the cart is before the horse, and emotional complexes, as it were, come after the event and are entirely secondary in nature. It is in such cases as these that the Freud-Jung-Adler theories appear inadequate. We turn with interest again to the teachings of Charcot and his ideas concerning neuro-muscular tonus, or neuro-vegetative tonus, and their hyper- and hypo-tonicities.

Since the teachings of Freud and his followers we have been so imbued with the idea of some sort of complex conditioned in our own lives as the cause of all nervous phenomena that some of the Freudians have even gone so far as to treat epilepsy by psychoanalysis.

We see then from the clinical viewpoint two great types of the neuro-psychoses, the one which may be said to be almost entirely endogenous or autonomic in character, and the other exogenous, depending for its reaction to a greater or lesser degree on environmental conditions. They are both for their reactions dependent on nervous mechanisms age old in their evolution and development, and in order to visualize these mechanisms properly we may think of them as reflex arcs just as truly as the reflex arc responsible for the knee or ankle jerk. The only difference is the knee jerk represents the reaction of a lower center and a simple arc, while nervous phenomena are the reactions of higher centers and more complicated arcs. The knee jerk is much increased in a patient during excitement. The same thing holds

good in the reflex arcs of the higher centers. The analogy might be continued indefinitely. Of course, in these two types one is scarcely ever found absolutely true to type. Characteristics of both types are found in each, but it is the predominating characteristic which determines the type under which the case is to be enrolled. We would scarcely enroll the epileptic under the exogenous or emotional complex type because we know epileptic attacks occur under the most favorable environment conditions. On the other hand, we can not deny that a multitude of things such as a dog fight or a piece of mince pie might precipitate an attack.

The golf player is remarkable in the number of alibis he is able to give to account for his hooks and slices. The nervous patients and their relatives are equally remarkable in the skill with which they are able to recall sunstrokes, falls out of high chairs, etc., to explain the reactions of inherited mechanisms. Consequently the history of the case, which should be such an important factor, is apt to be extremely misleading. A sister-in-law of a recent patient with melancholia said of this patient that she was never much interested in her home, that she was not satisfied with her husband's salary, that she always wanted something better in the way of clothes than she had, that she was lazy and fault-finding, etc. Here, then, was an inferiority complex made to order. The thing was easy. We would unroll the scroll of the patient's past life on a magical screen before her, show her how her present state was merely the natural result of an inferiority complex, and presto produce a complete revolution in her mental attitude. We carried out our part of the program. All the patient's shortcomings were carefully pointed out to her, to which she meekly agreed. Her depressed state of mind made her willing to admit everything we said and more, but her mental reaction remained unchanged. When we got all through she finally said, 'I just don't think it's that way, Doctor. I felt good last winter, and this thing sort of dropped down on me suddenly like a 'bolt out of the blue'." Here again another case according to the Freud-Jung-Adler concepts caused by inferiority complexes, but in which they were actually as little responsible as they are in the epileptic attack.

There is one thing more which we regard as exceedingly important in the elaboration of this conception of the psycho-neuroses, which is well shown in the patient just mentioned. This is an understanding of the part which the unconscious plays —the real unconscious in the current sense in which we use this term as the opposite of the conscious. In a former attack, according to relatives, the patient reacted in much the same way as at present. She was depressed, constantly depreciated herself, was indifferent to her surroundings, took no interest in anything, and thought she was wicked and doomed. The attack completely passed over. The normal individual, the normal consciousness, would make contact with this reality, especially when it was pointed out to him, and this knowledge would help him to recognize the entire morbid mental content as due to illness. The normal consciousness would resolve the situation something like this: "I had these same thoughts before. After a while they passed away. The depression cleared up entirely. I saw when I became well that my ideas of personal unworthiness, my feeling that I was doomed, my desire to die, were all wrong. They were not due to wickedness as I thought then; they were due to sickness. I will not make the same mistake again. I will profit in my mental reaction by my former experience." Such patients are never able to make this normal contact with the reality of their former illness. In their present state they are entirely unconscious of the incidents of a former attack, just as much as if they never had it. This unconsciousness may be compared with that of the ostrich who sticks his head in the sand and then feels because he sees no one that nobody can see his great body and legs. Or to the little boy who covers his eyes with his hands and then thinks no one is able to see him. The consciousness in all these cases is disturbed, contracted, much like vision in hysterical blindness. In the hysterical blindness the vision is narrowed down so that the patient can only see what is directly in front of him. What is taking place at the sides he is unaware of and, still worse, he does not know he is unaware of it. If some one accidentally collides with him on the street he becomes indignant, feels perhaps he has been insulted, when, as a matter of fact, the accident was entirely due to a visual disturbance of which he is not conscious. This illustration of a normal reaction to an unconscious disturbance of vision makes in our opinion the explanation of the symptoms of what we have called the complex type of nervous patient —that is, the patient whose secondary or hysterical

reactions proper are caused by some emotional disturbance. There is first this contraction of consciousness, naturally an increase in the extent of the unconscious, and as a result the inability to make normal contact with reality. Let us carry the comparison between the patient with the hysterical contraction of vision and the same type of contraction of consciousness a little further. They both feel they are right, and from their point of view they are. There is only one difficulty with it, and that is they both start with a false assumption, the blind man that he sees well, the man with the contracted consciousness—the unconscious—that he thinks straight. Their reasoning and conduct are quite rational, granting their fears or delusions to be true. In all our neurotics and psychotics the fatal defect lies in the false premise. The same thing applies equally as well to the anti-social type. Their arguments may be sound, but the premises from which they begin are mere assumptions. As an illustration, recently we read in the paper the statement by a well-known "progressive" concerning evolution, "There are something like thirteen thousand scientists in this country who believe in evolution, but we must understand there are 110 million people who do not. Who shall prevail, the thirteen thousand or the 110 million?" Of course, there is no question who would prevail if the assumption were true that all the scientists were evolutionists, and all the 110 million other inhabitants were not. This is a very good example of the method of reasoning of this kind of patient, or individual, or, for that matter, with what may be called the ostrich type of consciousness. We have at present under observation a neurotic patient who some time in every twenty-four hours dies once or twice, and she has been dying in the same way for quite awhile. If she were able to make contact with reality, to be conscious of her former dying spells in her present ones, the absurdity of this death scene recurring over and over again would soon stop it. The only reason the performance continues is because thus far she is unable to make this normal contact.

Summary: We see in our studies two great causative factors in the psycho-neuroses. First, the emotional disturbance, or complex, which is always in varying degree under the control of the will. These symptoms, which are the direct result of the complex, have been called by Löwenstein in his "simulation" experiments the primary ones. Second, the symptoms which are in no way under the patient's control and either may or may not be an indirect reaction as the result of the complex. These are regarded by the same author as the true hysterical symptoms. It is in these symptoms, due sometimes to emotional tension, sometimes occurring spontaneously, that something seems suddenly to slip, to use a homely expression, like the belt on the pulley which runs the machinery. The machines slow down, almost may come to a stop, when just as suddenly perhaps the belt on the pulley tightens, the machines speed up, and the usual "factory hum" is again heard. We ourselves like to think of the vagus and sympathetic, the vegetative nervous system, as the belt. There is one great distinction to keep in mind between the complex and epileptic types, using the term epileptic in the sense of comparable reactions. In the complex the belt on the pulley was never exactly a fit. It has been slipping to a certain extent all the time, sometimes more, sometimes less. The consciousness of such patients is in a varying state of continual contraction. This is easily recognized in the confirmed neuropath, a psychopath, or even in the anti-social individual. Owing to their contraction of consciousness they never seem able to make normal contact with reality. In the epileptic type, however, the contraction of consciousness is apt to be more of a temporary nature. When the attack passes over, complete or nearly complete mental vision is restored. One thing more, in the management of all these cases, let us remember, it is not so much the hunter who causes the ostrich to stick its head into the sand. That particular reaction has long been a habit in the ostrich family.

REFERENCES

White: The foundations of psychiatry.

Jelliffe: The technic of psychoanalysis.

Löwenstein, Otto: Experimentelle Studien zur Symptomatologie der Simulation und ihrer Beziehungen zur Hysterie. Arch. f. Psychiat., December 24, 1924, Seite 360.

SPONTANEOUS MENINGEAL HEMORRHAGE: WITH REPORT OF SEVEN CASES*

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The main types of intracranial hemorrhage which one encounters can readily be classified into three groups. The one group is the ordinary cerebral apoplexy associated with hemorrhage into the substance of the brain, and accompanied by definite clinical evidences of gross cerebral pathology. The second group are the cases of extradural hemorrhage associated with head trauma and for mechanical reasons usually small and well defined. In the skull the dura, adherent to the bony case, prevents excessive bleeding, while in the spinal canal the peridural fat and connective tissue serve as a similar obstruction. In the third group we place the cases of meningeal hemorrhage due either to injury to the head or to non-traumatic factors. Those cases in which no trauma exists are spoken of as spontaneous meningeal or subarachnoid hemorrhage.

In the study of 124 cases collected from the literature Symonds[1] found that the known pathologic causes of this hemorrhage are those which lead to bleeding elsewhere in the body. In seventy-one cases a definite etiology was noted. Arteriosclerosis associated with cardiac or renal disease and of toxic or infective origin is the most frequent factor. Weakened arterial walls may rupture or lead to the formation of an aneurysm, with subsequent rupture. In the toxic-infective group are placed the acute bacterial infections of hemorrhagic type, chronic alcoholism and syphilis. Although syphilis is the most frequent cause of aneurysm in the general arterial system, it less often produces this result in the cerebral circulation. This is probably due to the fact that in syphilitic infection of the cerebral blood vessels there is a greater tendency to proliferation of the intima (Huebner's endarteritis) with thrombi formation than to degeneration of the media and adventitia, with a subsequent weakening and dilation of the blood vessel wall. Other causative factors are aneurysms due to local defects of the media, possibly of congenital origin, blood diseases, thrombosis of the superior longitudinal sinus, eclampsia, sunstroke, and degenerative tumors or cysts. In forty-one of the 124 cases no definite etiology was given. Various theories have been advanced to explain these cases. Symonds believes that a ruptured aneurysm is the causative factor in the majority of instances. This may be either on an arteriosclerotic foundation or due to a local congenital defect of the media. In the forty-one obscure cases the ages varied from ten to fifty-eight, with an average of thirty. This is too young for the usual arteriosclerotic changes. In eighteen of the cases no adequate cause could be found, even at postmortem. However, a ruptured aneurysm may have been present, undetected because of its small size or it may have been buried in the extensive blood extravasation.

Goldflam,[2] on the other hand, does not include cases of ruptured cerebral aneurysm in his group of spontaneous meningeal hemorrhage. He believes that those cases, with an unknown etiology in the young, are a true diapedesis. He suggests that the fundamental cause may be a functional disturbance of vasomotor control, and the bleeding of venous origin, analogous to that which is said to occur in migraine, Raynaud's disease, and erythromelalgia. An active hyperemia is produced by the irritation of the vasodilators and the paralysis of the vasoconstrictors. This inflammatory congestion occurring in blood vessels with impaired walls is the basis for the capillary oozing on the surface of the brain. Goldflam[3] reports thirteen cases but without sufficient detail or postmortem findings to substantiate his theory. A definite history of migraine was given in seven of his seventeen cases.

Pathologic studies by McKinley, Polczak, and Young* seem to support Goldflam's theory. In a personal communication received from them they state as follows:

"Diffuse hemorrhage into the subarachnoid space was the characteristic feature of the gross pathology of our cases. Microscopically we found meningeal, and occasionally cerebral, vessels, particularly of the venous circulation, surrounded by perivascular infiltrations of lymphocytes. The red cells in the hemorrhages were fairly well preserved for the most part. It seems evident to us that inflammatory degeneration of the vessel walls was the factor responsible for the hemorrhage in each of the cases."

*Retiring President's Address, Ramsey County Medical Society, January 25, 1926.

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The symptoms of spontaneous meningeal hemorrhage depend upon the extent and location of the hemorrhage (either supra- or infratentorial). These manifest themselves in the main by evidences of meningeal irritation, by signs of increased intracranial pressure, and by an hemorrhagic spinal fluid. The occurrence of a monoplegia or hemiplegia or other paralytic phenomena is very rare and if present is usually of short duration. These symptoms are due to mechanical causes and produced by the pressure of the extravasated blood upon the surface of the brain. Their transient character is an important diagnostic point in differentiating from a cerebral hemorrhage, from hemorrhagic encephalitis or other destructive lesions involving the brain tissues themselves. If the hemorrhage is an extensive one, such as occurs with the rupture of an aneurysm or of one of the larger arteries, the patient is suddenly seized with a severe headache, becomes unconscious, passes into a state of coma, and dies within a few hours. The correct diagnosis can be suspected when, upon lumbar puncture, a uniformly hemorrhagic spinal fluid is found, but can only be verified by a careful postmortem examination. If the hemorrhage is not as extensive and more gradual, the patient usually complains of a severe headache, which may or may not be followed by a short period of unconsciousness. Soon after, irritative meningeal symptoms manifest themselves. The headache continues with great severity and is accompanied by nausea, vomiting, and mental confusion. There is marked neck rigidity, a positive Kernig, the patient may complain of photophobia, restlessness, and muscular twitchings. The reflexes may be normal or pathologic. There is usually a moderate fever. The spinal fluid is under pressure and uniformly hemorrhagic. If the bleeding continues, the intracranial and irritative phenomena become more pronounced until exitus occurs. If the bleeding subsides the symptoms disappear fairly rapidly and the patient may recover. However, there may be a recurrence in later years.

The hemorrhagic spinal fluid is perhaps the most important diagnostic sign. The spinal fluid is under increased pressure, contains an even admixture of blood in a series of specimens collected at the same puncture, does not form a coagulum, and the supernatant fluid obtained from centrifuging or standing is definitely brownish or yellowish in color. This pathologic fluid can be readily differentiated from the accidental contamination of blood at the time of lumbar puncture. In the latter case the fluid is definitely bloody at first and then gradually becomes clear, a clot forms on standing, and the supernatant fluid is colorless.

A hemorrhagic spinal fluid as a result of an intracranial lesion signifies that bleeding has occurred either into the subarachnoid space or into one of the ventricles. In spontaneous meningeal hemorrhage the blood almost invariably enters the subarachnoid space. In supratentorial lesions, where the visceral layer of the arachnoid is relatively closely applied and attached to the pia mater covering the cerebral convolutions, diffusion of the blood is slow. There is a tendency to clotting, and the surface of the brain is covered by a thin hemorrhagic layer. If the bleeding is rapid, localized cerebral pressure may occur because of these mechanical factors. In infratentorial lesions at the base of the brain, where the arachnoid is loosely attached to the pia, the extravasation of blood occurs more rapidly and extends with greater ease both upward into the cerebral subarachnoid space and downward into the spinal cavity. Clotting does not occur as readily and there is a greater tendency to prolonged bleeding.

Two other important symptoms which are found occasionally in spontaneous meningeal hemorrhage are the ophthalmoscopic findings and the phenomenon of massive albuminuria. The most important fundus changes are the occurrence of large retinal hemorrhages. In Case 3 of my series a large retinal hemorrhage was found in the temporal half of the left disc and a small one in the right eye. Symonds observed a similar condition in three of his cases. Postmortem findings in each one revealed an aneurysm of the internal carotid artery. Unfortunately, no autopsy could be obtained in my case.

In Neal's[4] series of thirty-five patients, twenty-one made a satisfactory recovery. In Symonds' 124 cases reviewed from the literature, in whom the hemorrhage was due to arteriosclerosis or ruptured aneurysm, the mortality rate was approximately 80 per cent, while in those cases of unknown origin and mainly in the young adult, only 44 per cent died. Three of our patients recovered and four died.

The most important therapeutic measure is repeated spinal drainage. It has been advised that during the bleeding period, where the increased

intracranial pressure has a tendency to check the hemorrhage and to hasten coagulation, a lumbar puncture is contraindicated except for diagnostic purposes. If too much spinal fluid is withdrawn at this time, sudden exitus may occur, probably because of an increase or recurrence of the hemorrhage. This is perhaps what caused the sudden death in our first case. Later on spinal drainage should be repeated at regular intervals, both for therapeutic purposes and for symptomatic relief from the severe headache and the other irritative phenomena. Furthermore, attempts should be made to increase the coagulability of the blood. For this, horse serum intraspinally and other hemostatic drugs are indicated.

The following seven case reports are illustrative of spontaneous meningeal hemorrhage:

The first case was a female, aged 44, seen in consultation with Dr. George Earl. Her family history was negative. Patient suffered frequently as a child from severe headaches, which were entirely relieved by wearing glasses. At thirty-two years of age she had a fall from a swing and was unconscious for a short time. For the past three years she had been in the best of health. After eating her mid-day dinner she went to her room and about four hours later someone heard a commotion and found that the patient had fallen down stairs. She had vomited and was semiconscious. With help she walked upstairs, but soon developed a restless, delirious state. This condition lasted until her death, six hours later.

An examination revealed that the patient was cyanotic; her breathing was stertorous. The reflexes were normal; there seemed to be a slight flaccid paralysis of the left lower extremity. The background of the eyes was normal. There was no involvement of the cranial nerves. The physical examination was negative. The blood pressure was 90 mm. Hg. and the urine was normal.

We suspected a pachymeningitis hemorrhagica or an acute meningitis, and advised a lumbar puncture. This was done and apparently pure blood, under pressure, escaped from the needle. During the process of the lumbar puncture the patient suddenly died.

The centrifuged spinal fluid gave a heavy, reddish precipitate, leaving the supernatant fluid a yellowish color. The examination of the precipitate showed many normal red blood cells, a few polymorphonuclear leucocytes and a few lymphocytes. The Wassermann was negative. No bacteria were found.

A postmortem examination was performed twenty-two hours later. There was nothing particular to note in the organs of the thorax and abdomen except an hour-glass stomach. The skull was of normal thickness. The dura was nowhere adherent. There was no indication of a fracture of the skull. When the dura was opened the brain was found bathed in blood. Blood-clots were seen, especially at the base of the brain. The blood was readily removed by washing and a small ruptured aneurysm, about the size of a hazelnut, was found near the bifurcation of the left posterior cerebral and the posterior communicating arteries. Cut sections of the brain were normal on gross examination. It is of interest to note that there were no previous symptoms indicative of an intracranial lesion.

Case 2* was a female thirty years old, a housekeeper, seen in consultation with Dr. D. L. Dawson, Rice Lake, Wisconsin. Her family history was unimportant except that her mother died at sixty-two of splenomyelogenous leukemia. Her personal history revealed an appendectomy at the age of twenty and attacks of hoarseness and chronic nasal catarrh for many years. She contracted a "severe cold in the chest" a few weeks ago, which had entirely subsided before the onset of the present illness. She was taken suddenly ill with an excruciating headache in the occipital region, with rigidity of the neck and with vomiting. These symptoms gradually increased in intensity. She was extremely restless and no relief was obtained with 10 grain doses of barbital every four hours. The neurological examination was negative except for a slight rigidity of the neck. During the next three days a positive Kernig developed, and the rigidity of the neck became more marked. Her temperature was normal until the fourth day, when it rose to 100.2 F. The patient was confused and the irritative meningeal symptoms were more pronounced. A lumbar puncture was performed and 60 c.c. of spinal fluid, under great pressure, was removed. This was uniformly hemorrhagic, formed no coagulum, the supernatant fluid was definitely yellowish, and no bacteria were found. The headache was greatly relieved and the general condition improved. Forty-eight hours later 45 c.c. of spinal fluid under increased pressure were removed. The fluid was yellowish, contained a trace of globulin, 55 cells per cm., mostly lymphocytes, a negative Wassermann, and a negative colloidal gold curve. The rigid neck and Kernig sign were still present but were less pronounced, otherwise the neurological examination was negative. The backgrounds of the eyes were normal, urine negative, blood pressure, systolic 125, diastolic 75. Three days later 20 c.c. of clear spinal fluid under normal pressure were removed. The patient made an uneventful recovery in three weeks.

Case 3 was that of a woman, thirty-six years old, a stenographer. She was seen in consultation with Dr. D. Kalinoff, Stillwater, Minnesota, November 26, 1925. Her family and personal histories were negative except that she suffered from an occasional headache, apparently not migranous in type. On October 26, 1925, while reading, she suddenly became blind in the right eye. Vision gradually returned in twenty-four hours. She was seen by Dr. S. G. Larabee of St. Paul, October 28, at which time her fundi were negative, and with proper glasses her vision could be brought up to normal. She remained well until November 23, at 12:30 A. M., when, while returning home from a party, she was suddenly seized with excruciating, diffuse headache. This was so severe that she was unable to continue with her walking and she was taken into a nearby house. Within one-half hour persistent emesis developed. She was given ½ gr. of morphine within the next half hour, without any relief from the headache.

*Previously reported by Dr. D. L. Dawson,[5] Wisconsin Medical Journal, February, 1924.

The neurological examination was negative throughout except that both knee jerks were moderately increased.

Her headache continued until the next day when a lumbar puncture was performed and 20 c.c. of spinal fluid, uniformly bloody and under markedly increased pressure, were removed. Her headache was somewhat relieved and her general condition improved, until the late afternoon of the following day, November 25. She then gradually became stuporous and continued in a heavy sleep all night. She could be awakened with some difficulty, after which she was rational and answered questions coherently. When undisturbed she would soon return to her stuporous condition.

I first saw her on November 26, 1925, at 3 P. M.. She was stuporous, but could be aroused, talked coherently, and recognized people. The neurological examination was normal except that her neck was rigid. There was a positive Kernig bilaterally: both knee jerks were sluggish. Babinski on the left was negative; on the right, questionable.

The examination of the backgrounds of the eyes revealed the following: On the left, a large recent retinal hemorrhage extending over the entire temporal half of the fundus. The nasal half appeared normal. On the right, a small recent retinal hemorrhage on the temporal side.

The physical examination was negative. The urine was normal except for a trace of albumin.

Twenty c.c. of spinal fluid were removed, under increased pressure, uniformly hemorrhagic; no coagulum formed on standing. The supernatant fluid was yellowish. The sediment contained many red blood cells and leucocytes but no bacteria. The Wassermann was negative. Blood pressure, systolic 140, diastolic 80.

After the removal of the spinal fluid she appeared less drowsy. However, her headache increased in severity for about ten minutes, then gradually subsided. She improved for a few days under repeated lumbar punctures and thrombo-plastine hypodermically. She then gradually became worse, her irritative symptoms became more pronounced, and she died December 1, 1925.

During the first three days of her illness her temperature and pulse were normal, then gradually increased to the time of her death. No postmortem was obtained. This was the only case in our series that manifested any changes in the fundi of the eyes.

Case 4 was a male, aged 67, seen in consultation with Dr. H. Aldes, January 18, 1926.

The family and personal histories were negative except that ten years ago he had an attack of acute nephritis with a blood pressure of 210. His wife states that he was perfectly well until 8 P. M., January 14, 1926, when, while playing cards, he suddenly developed an excruciating occipital headache, accompanied by vomiting. He was very restless during that night. His headache and vomiting continued. He became somewhat confused and very irritable. His symptoms gradually became more pronounced, and I first saw him four days after the onset of his illness.

He complained of severe occipital headache and a stiff neck. He was confused and disoriented, thought that the date was Friday, February 17, 1921. (It was Monday, January 18, 1926.) His pulse was 80; temperature normal; blood pressure, systolic 152, diastolic 78; urine normal. His cranial nerves were normal except that his pupils were miotic but responded to light and accommodation. All extremities and reflexes were normal; Babinski negative; no ankle clonus. He had a rigid neck and a definite Kernig sign.

Sixty c.c. of spinal fluid, under increased pressure, were withdrawn. This was uniformly hemorrhagic, contained many blood cells, a negative Wassermann, no organisms, and the supernatant fluid was yellowish.

Daily lumbar punctures were performed. The clinical picture gradually improved and the spinal fluid became less hemorrhagic. On the evening of January 22 his abdomen became greatly distended, and the following morning he vomited large amounts of liquid material containing fecal matter. He evidently developed a paralytic ileus. Soon after, his headache became more pronounced, and one hour after his attack of emesis a lumbar puncture was performed. The spinal fluid was under increased pressure and contained much blood. His condition grew worse and he died forty hours later. In all probability the excessive straining associated with the vomiting caused a recurrence of the intracranial hemorrhage. No postmortem could be obtained.

Case 5 was that of a woman, aged 35, seen in consultation with Dr. R. B. Schoch, October 9, 1924. Her family and personal histories were negative. She had been under Dr. Schoch's observation during the preceding nine months for her pregnancy (primipara). Her urine and blood pressure had been normal throughout. Her pregnancy had been uneventful in every way and she was admitted to St. Luke's Hospital at 11 P. M., September 23, 1924, in labor. The labor was normal, although somewhat prolonged, and she gave birth to a healthy child at 4:15 A. M., September 25.

During her delivery, at the height of a very severe uterine contraction, she suddenly complained of an excruciating occipital headache. Chloroform was administered soon after and the patient delivered. At 8 o'clock the same morning her blood pressure was systolic 190, diastolic 88. Severe headache continued and the patient seemed somewhat confused, drowsy, and very restless. Her neck was rigid. While asleep there was some twitching of the muscles of the right extremities. She had to be catheterized. Her temperature was normal and pulse 120. She was unable to move her head because of severe occipital pain. All symptoms gradually increased.

On September 26, her pulse was 160, respiration 16, temperature normal. She became more stuporous and gradually developed a paresis of the right arm and leg. Her neurological symptoms remained stationary but there was a gradual physical improvement, and by 4 P. M., September 27, her pulse varied around 100. Her headache, restlessness, confusion, and paralysis continued, associated with periods of stupor; temperature around 100 F., pulse 110. On October 3 a lumbar puncture was done and 30 c.c. of spinal fluid were withdrawn. This was under increased pressure, uniformly hemorrhagic, contained many red blood cells, but no organisms.

Following the spinal drainage the headache improved, the restlessness subsided, and the patient appeared quite rational. Spinal drainage was repeated every second day

for five days, then daily for seven days, and after that at irregular intervals.

From 30 to 55 c.c. of spinal fluid were removed at each puncture. The hemorrhagic character of the fluid gradually subsided, the fluid became yellowish, and at the last drainage, October 21 (26 days after onset), it was clear and of normal color. Except for an excess of globulin, the bloody condition and the many blood cells, the spinal fluid was normal throughout.

On my examination, October 8, her cranial nerves were normal but the retinal vessels were somewhat distended; there were no hemorrhages. She had some paresis of the right arm and leg, bilaterally increased knee jerks, and a positive Babinski; Kernig negative; neck somewhat rigid. Blood pressure, systolic 130, diastolic 65.

On October 11 her paralysis had definitely improved and by October 20 the function of all extremities was normal. However, there was still some aphasia present, which also subsided after several months.

Two days after the onset of her acute illness, her urine contained a large amount of albumin and a few granular casts. This continued until October 8, when the urine became normal and remained so during her stay at the hospital. On October 1, her hemoglobin was 65 per cent; red blood count 3,770,000; leucocytes 19,400. On the day of her discharge, November 8, 1924, her blood pressure was, systolic 110, diastolic 75.

The early portion of this case history is very suggestive of an intraventricular hemorrhage or a hemorrhage into the internal capsule, but the rapid improvement following spinal drainage and the complete recovery from the paralysis exclude these two localizations.

Case 6 was a male, aged 33, seen in consultation with Dr. C. E. Hensel, July 23, 1923. His family and personal histories were negative except that at the age of ten he had an attack of otitis media. His present illness began July 6, 1923, when he was awakened about midnight with a terrific occipital headache. After taking aspirin he was able to sleep quite well the remainder of the night. The following morning he felt weak and tired and had a severe attack of emesis while at his office. He returned home at noon, because of headache and backache, rested for two days, then went back to his office for five days. During this time his headache and backache gradually became more severe and his sleep was poor and restless. On July 16, after he had finished his meal, he walked into the next room and suddenly became unconscious. This cleared up in about twenty minutes, after which he had severe headache, backache, and emesis for five days. The vomiting ceased but his headache continued. When examined on July 23 he was confused and irrational, complained of severe occipital pain and backache. His cranial nerves were normal, his neck rigid, a positive Kernig was present, knee jerks increased, no Babinski or clonus, no evidence of paralysis. All other findings were normal. The spinal fluid was under increased pressure, uniformly hemorrhagic, and contained many red blood cells. The supernatant fluid was yellowish, the Wassermann was negative, and there were no bacteria; the urine was normal except for a trace of albumin. Leucocyte count was 9,650, differential count normal. Blood pressure, systolic 128, diastolic 75.

Under symptomatic treatment and repeated spinal drainage the clinical symptoms gradually subsided and the patient made a satisfactory recovery. He was able to leave the hospital September 28, 1923. With repeated lumbar punctures the spinal fluid gradually became less hemorrhagic and returned to normal. The patient remained well except that he tired more readily than before.

Two years later, on July 18, 1925, he had a similar attack. His wife was awakened at 4:30 A. M. by the sound of his groans. He was conscious, somewhat rigid, and his arms and legs jerked occasionally. He was nauseated and vomited several times. He improved for an hour, then suddenly developed a terrific occipital headache, and some stiffness of the neck. He became very restless and irritable.

The neurological examination was negative throughout except for a positive Kernig and neck rigidity; blood pressure, systolic 116, diastolic 58; urine normal; leucocytosis 18,250; spinal fluid under increased pressure, markedly hemorrhagic, a negative Wassermann, no bacteria, sugar 0.111; temperature, normal; pulse 70.

He was given repeated spinal drainage and acriflavine intravenously. He made a satisfactory recovery from this attack.

During his second illness he was seen by Dr. Hensel and Dr. Riggs. Just before he left the hospital, September 2, 1925, Dr. Hensel kindly permitted me to examine him. His neurological findings were normal in every way and he felt well.

Recurrent attacks of spontaneous subarachnoid hemorrhage have been reported in the literature. Eskuchen's[6] patient had a recurrence in eighteen days; Goldflam's patient, in forty-two days. Matzdorff reports a case in which the second attack developed after seven years, while Simdowicz's patient had three attacks in three years.

Case 7 is that of a male, aged 46, seen in consultation with Dr. C. B. Teisberg, April 2, 1924. His family and personal histories were negative. On March 30 he developed severe headache and restlessness. He gradually became lethargic, complained of diplopia, and had a temperature of 102.

His spinal fluid was under pressure, clear, 9 cells, a negative Wassermann, a negative colloidal gold curve, sugar 0.11. A diagnosis of epidemic encephalitis was made. He slowly improved and after two months was able to be up and around. He made a complete recovery except that he lacked endurance, was easily fatigued, and had an occasional headache. The neurological findings were negative.

Nine months later, while riding in a streetcar, he suddenly developed a severe headache and soon after became unconscious. He was taken to the Ancker Hospital. He remained unconscious; his neck was somewhat rigid. He presented no evidence of paralysis. A lumbar puncture revealed a uniformly hemorrhagic spinal fluid. He died within sixteen hours. No postmortem was permitted. A diagnosis of spontaneous subarachnoid hemorrhage, secondary to arterial changes due to epidemic encephalitis, was made.

Inflammatory changes in the blood vessels of the meninges in an acute case of encephalitis have been noted by McKinley,[7] myself, and others. Otero[8] reported two cases similar to ours and states that Rathery and Netter have recently published instances of meningeal hemorrhage in the course of that disease. It is quite possible that in our case sufficient degenerative changes occurred in the blood vessel wall, with a resultant rupture and hemorrhage. In cases of sudden death with a hemorrhagic spinal fluid, in chronic epidemic encephalitis, this condition should be considered.

Although the characteristic symptoms of spontaneous meningeal hemorrhage are a hemorrhagic spinal fluid and evidences of meningeal irritation, other diseases may simulate this condition. The following two cases are illustrative:

Case 1 was that of a child seven and a half years of age, seen in consultation with Dr. Asa Johnson, November 18, 1925, with a negative family and personal history except for an occasional attack of headache and vomiting during the past two and a half years. Since January, 1925, she had three attacks, each of twelve hours' duration.

The mother stated that on November 17 at bedtime the child seemed somewhat restless but finally quieted down and slept well until 4:30 A. M. She then complained of severe headache and vomited. Soon after she seemed somewhat drowsy. Dr. Johnson saw her at 6 A. M., at which time she was semi-stuporous, restless, and apparently nauseated. When I saw her at 9 A. M., she was unconscious and restless, had a somewhat rigid neck, and a flaccid paralysis of her left face, arm, and leg. The right pupil was dilated and larger than the left. Both responded to light; both fundi were normal. There was paralysis of the left seventh nerve. The reflexes in the upper extremities were normal, but there was a flaccid paralysis of the left arm. Both knee and Achilles jerks were absent; there was no Babinski or clonus; there was a flaccid paralysis of the left leg.

The spinal fluid was under increased pressure, uniformly hemorrhagic, Wassermann negative.

The patient gradually grew worse and died one-half hour later.

A postmortem of the head only, revealed a large subcortical hemorrhage in the right cerebral hemisphere which had ruptured into the ventricles. Cross section revealed a degenerating glioma in this region, which was the primary cause of the hemorrhage.

Case 2** was that of a female, aged 30, married, seen in consultation with Dr. J. C. Ferguson, October 13, 1925.

The family and personal histories were negative. The family stated that she had been perfectly well. She left her home on October 12 at 8 P. M. to take part in a musicale and to visit a friend. A quarter to one that night the doorbell rang three times. When they opened the door they found the patient lying in front of the door apparently semi-conscious, bleeding from the nose, and a little blood on her stocking and on the porch floor. The family thought she had been struck by an automobile and placed on the porch. However, there was no sand or dirt in her hair or on her clothes, and no evidence of violence or external injury.

Dr. Ferguson saw her at 10 o'clock that morning, when her temperature was 102, pulse 100. The patient was semi-conscious, and her neck was slightly rigid. I was asked to see her about 8 P. M. The patient was still semi-conscious, resistive, and gave the impression of a catatonic dementia precox. When her arm was lifted she would hold it in that position and gradually drop it. When an attempt was made to open her eyes she would hold them tight. She was definitely resistive. Her neck was rigid. She had a questionable Kernig. All reflexes were normal. There was no evidence of any bruise on the head or on the body. She continually rubbed her forehead with her hand as if she had a severe headache. Her temperature at this time was 102.5, pulse 100, respiration 25, and her general condition was fair.

A lumbar puncture was done and about 35 c.c. of spinal fluid were removed, which was almost pure blood. Following the spinal drainage there was no special change in her condition. At 10 P. M. she died quite suddenly.

Permission was given for a postmortem of the head only. Between the scalp and the occipital bone was a small diffuse hematoma about 5 cm. wide and 10 cm. long. On opening the skull there was a diffuse hemorrhagic exudate extending over both hemispheres, with a small blood clot under the left frontal lobe and a large blood clot about the size of a small egg under the right frontal lobe. The convolutions of both frontal lobes were quite macerated. The skull showed a fracture in the occipital region extending about 7 cm. on the right side from the sagittal suture longitudinally through the occipital bone. On the left side the fracture line extended from the sagittal-lambdoid junction through the occipital bone into the foramen magnum. There were several short radiating fracture lines besides, beginning in the same area. The patient evidently rang her doorbell, fell, and the impact from the fall on the wooden floor was sufficiently marked to produce the occipital skull fracture with the marked contra-coup hemorrhage of both frontal lobes. The hemorrhage evidently was secondary to the fall and not primary, because its location and distribution were such as one would expect in a contra-coup lesion in relation to a blow in the occipital region.

This patient sustained a skull fracture with traumatic meningeal hemorrhage. Without the evidence of any head injury or without a postmortem examination, the diagnosis of spontaneous meningeal hemorrhage would have been the probable one.

CONCLUSIONS

The syndrome of spontaneous meningeal hemorrhage is sufficiently well defined to enable one to make the correct diagnosis.

A hemorrhagic spinal fluid, especially without definite localizing cerebral manifestations, is suggestive of this disease.

**Previously reported in the Journal-Lancet, December 15, 1925, Page 596.

Although the clinical course is frequently a stormy one, the prognosis is often not as grave as the symptoms would indicate.

BIBLIOGRAPHY

1. Symonds, C. P.: Spontaneous subarachnoid hemorrhage. Quart. Jour. Med., October, 1924.
2. Goldflam, S.: Etiology and symptomatology of spontaneous meningeal hemorrhage. Deutsch. Zeits. f. Nervenh., February, 1923.
3. Goldflam, S.: Cyst formation of the cauda equina and cerebral and spinal subarachnoid hemorrhage. Deutsch. Zeits. f. Nervenh., March, 1925.
4. Neal, J. B.: Spontaneous meningeal hemorrhage. Jour. Am. Med. Assn., January 2, 1926.
5. Dawson, D. L.: Case report of spontaneous meningeal hemorrhage. Wis. Med. Jour., February, 1924.
6. Meylan, K.: Spontaneous diffuse meningeal hemorrhage. Deutsch. Zeits. f. Nervenh., April, 1923.
7. Hammes, E. M., and McKinley, J. C.: Lethargic encephalitis: Symptomatology and histopathology. Arch. Int. Med., July, 1920, 26, 60.
8. Otero, J. Garcia: Abstracted in Jour. Am. Med. Assn., October 4, 1924, p. 1112.

IRON AND BLOOD REGENERATION

"The history of anemia treatment with drugs is indeed a tale to make the judicious grieve." On the whole, iron seems to enjoy the most constant favor by practicing physicians. The clinical control of the treatment of anemia is difficult and the number of variables almost infinity. As a result, widely differing views as to the efficiency of iron preparations have been recorded. Less than four years ago, Whipple wrote that among the potent factors exerting a positive influence of hemoglobin formation, stands first blood, meat and cooked liver, hemoglobin and butterfat. He found iron and arsenic in the common drug preparations inert under the conditions of his experiments. Williamson and Ets subsequently concluded that inorganic iron is absorbed and may be found in the liver and spleen, but is not converted into hemoglobin and that animals made anemic by bleeding did not recover more rapidly when inorganic iron is given. Williamson believes that the efficiency of food iron is pronounced. Recently, Barkan found that digestive ferments do not liberate iron from hemoglobin. This means that, if the pigment facilitates blood regeneration, it is not so much iron as the complexes with which it is associated that determines hematopoietic efficacy. (Jour. A. M. A., April 3, 1926, p. 1075.)

THE ZOALITE LAMP

This is a device for producing radiant heat for therapeutic purposes. The heat is produced by a "resistor" which is heated by an electric current. The radiant energy emitted by this unit is not unlike the radiant energy produced by an incandescent body such as a bar of hot iron or the filament of a tungsten lamp. The therapeutic value of the Zoalite is precisely that of other sources of radiant heat. (Jour. A. M. A., April 3, 1926, p. 1091.)

SOME PSYCHOANALYTICAL CONSIDERATIONS*

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Psychoanalysis as a method is to be distinguished from the speculations which psychoanalysts find so fascinating and which they sometimes carry to unbelievable lengths, as witness a story by Dr. White about Dr. Jelliffe.

Dr. White prefaced his story by saying that it seems fairly well established that the sense of time and rhythm are acquired in utero from listening to mother's heartbeats. He then went on to say that Dr. Jelliffe was attending a medical meeting and the question of the remarkable rhythmical sense of a famous composer of jazz music was brought under discussion. Dr. Jelliffe suggested that possibly his mother suffered from cardiac disease. The physician who attended the composer's mother was present. He said that she had suffered from heart trouble all of her life and had died of it.

The Viennese physician, Sigmund Freud, was the first to get beyond the purely descriptive stage in the study of the neurotic's symptoms, and into an interpretive attitude towards their production. It is largely through the impetus of his work that the vast new field of modern psychiatry has been opened. It is largely his work and that of his pupils who have diverged only slightly on which I shall dwell. Before proceeding with an outline of its development, I will attempt to explain some of the fundamentals necessary for an understanding of it. Of primary importance is the libido. Its definition is love or lust. It is an unfortunate term which has gained such widespread usage that it is impossible to discard it. Originally it had a strictly sexual meaning. It retains its sexual sense but in addition has come to include mental energy. In the sense of love, it is possible to love someone else or to love oneself. These two phases are spoken of as object libido and ego libido (self love). Considering them in a larger sense, object libido (outside interest) has to do with the welfare of the race, ego libido (selfish interest) has to do with the survival of the individual. It is possible to understand the theoretical workings of the libido

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only if it is viewed as a force or form of energy. It is characteristic of forces in general to seek equalization. It is characteristic of the force, libido, to seek equalization, but satisfied at one level it immediately moves to a higher level. It does this by means of conflict. To use a simile of White's, the hungry man is in a conflict with his desire for food. All of his tendencies are to bring about actions which will neutralize these cravings. When this is done, the hunger satisfied, the man is free from conflict at that level and the libido is free to transfer its field of battle to a higher level; to write a poem, perform a surgical operation or storm the citadel. The libido is constantly seeking higher levels for its expression, and the individual's capacity for accomplishment depends upon the surplus after it is satisfied at a lower level. The ability to transfer the conflict from a lower to a higher level is called sublimation. It is the libido that suffers injury from the sexual traumatism which Freud finds such a constant factor in the psycho-neurosis. The injury interferes with the activities and ambitious acomplishments of the individual. Unconsciously the person seeks to excuse the general inadequacy of the trend of his life by the production of certain symptoms.

I have in mind a case of psycho-neurosis which seems to illustrate very clearly how sexual traumatism interferes with the normal activity and ambition. It was a case of the compulsion neurosis, the so-called hand-washing neurosis. The young woman was washing her hands every few minutes during the day—a ceremonial which always suggests a sense of guilt. Lady Macbeth and Pontius Pilate are noted examples. Her hand washing was obviously associated with ideas of contamination from dirt, or bacteria from shaking hands or other sources. The necessity for washing her hands detracted from her general efficiency, but more distressing was the narrowness of her interests and activities. I suggested to her at one time that she was as strictly confined by her illness as if she was in prison. This suggestion was met by an emotional outburst and she cried convulsively for about half an hour. The outburst was the result of a rather carefully planned coupe for producing just such an explosion which was the mental catharsis of Freud and Bleuler. Let us follow up the analysis as an example of how it links together repressed incidents which have a distinct bearing upon the production of her difficulty. We will omit certain sexual features which may be taken for granted. The girl's father was a drunkard and when she was a child it was the habit of her two grown brothers to attempt to get him out of saloons before his money was spent. Frequently they would fight with him, and the young girl, seeing these fights, feared that they would murder him, and be sent to prison. Sometimes at home the father would abuse and threaten her mother and the younger children. This fixed a dread and hatred of her father in her mind, because she feared he would murder them all in some of his drunken rages. The idea of murder was thus brought to her attention, and struck such terror into her heart that she began to fear the very word. Newspaper accounts of murders by poisoning made her fear that she might some day accidentally poison or contaminate something which would kill someone. This idea extended itself to her thoughts and she became obsessed by a dread that she would wish evil to someone else and that her wish would bring evil upon them. When it happened that someone whom she had wished might die did actually die it seemed to her that her fears had been confirmed. As her obsession grew and she became more confirmed in her belief that her thoughts and her hands were actually harmful to those around her. she had the startling misfortune of having her father die just as she touched him. This made her in her already overwrought condition feel directly responsible for his death. The feeling that she had been guilty of murder caused her to begin the habit of washing her hands, which habit, later, when the thoughts had been repressed, became an outlet for the nervous activity which remained. In addition to the habit of washing her hands so frequently, which naturally interfered with things which she should have been doing, her activities were still further restricted by a sense of shame which she felt on account of certain sexual delinquencies. This caused her to shrink from normal social contacts. With the additional idea of inflicting penance upon herself, which in a sense atoned for her sins, she gave up all pleasure.

The idea of being a prisoner was brought to my mind by one of her dreams, in which her mother and herself were chased by two men through a big house with many rooms and corridors and surrounded by a high wall. She finally lost her mother and escaped from the house.

The dream interpreted meant that she was a pris-

oner to her difficulties. The chase in the dream meant pursuit or courtship. At the time of the analysis she was engaged to a young man, but her mother objected on two scores,—first, the girl's nervous condition and secondly because she was very fond of the girl. In a dream, which, with one notable exception, according to Freud, is always wish-fulfilling in character, we see her eluding both the confinement of her difficulties and her mother's surveillance.

Looking at the larger aspects of this case we see that some phases of her sexual faults interfered with the normal direction which her activities should have taken. Thus we have an example of sexual traumatism causing injury to the libido. Her unconscious excuse for the general futility of her life was to seek refuge in an illness, the most conspicuous symptoms of which was hand-washing. The interpretation of the dream was one of the methods of approaching the underlying cause of her trouble.

To proceed to Freudian theories, Wertheimer,[1] in his very clear description of the subject, gives the development of Freud's theories in five stages.

In the first stage, Freud saw in sexual trauma the chief contributing factor in the production of the neurosis; at this stage Freud, as he later pointed out, overemphasized the importance of seduction in infantile life.

In the second stage Freud emphasized, in contrast to the infantile sexual trauma, his well known wider conception of sexuality, which he described in his book, "Three Contributions to the Sexual Theory."

In the third stage the important concept of narcissism was introduced. Narcissism has been described clinically by Nache as a sexual perversion in which the individual loves himself.

The fourth stage of Freud's theories is expressed in his book, "Beyond the Pleasure Principle." It contains speculations regarding the origin of the traumatic neurosis, as his attention was directed toward it by the shellshock cases during the war. Two facts seemed pertinent in the production of this neurosis,—first, the element of fright and, secondly, that if an organic wound of any considerable extent was produced, the neurosis did not occur. Regarding the first of these, Freud distinguishes between anxiety, fear and fright. Anxiety is a state of anticipation of danger and of preparation for it, even if the danger is unknown. Fear is directed towards a definite object. Fright is characterized by the element of surprise and thus occurs when, without preparation, one is confronted with a danger situation. In the traumatic neurosis the anxiety preparation is lacking. Anxiety, in fact, would prevent the traumatic neurosis. Fright is what causes it. Freud therefore speaks of it as a fright neurosis. Anxiety, viewed as a preparation against danger, has a special significance in relation to the traumatic neurosis.

Freud explains the preventive function of anxiety by introducing the concept of defense against stimuli. The living organism has not only the function of reception of stimuli, but also the more important one of defense against stimuli. The organism has to protect itself against being overwhelmed and crushed by the multitude of impressions continually pouring in upon it from the outside. It has to exclude most of these impressions and receive only a few which will serve as samples of the objects in its environment. The anxiety preparation causes a peculiar distribution of libido which prevents a breaking down of the defense against stimuli. Substituting Jung's term, "hormone," for libido, in this theoretical consideration, you can for example conceive of the organism distributing certain hormones or hormonie throughout the body as a preparation for the reception of greater than usual stimuli and thereby strengthening its defenses against the expected danger.

If an organic wound occurs at the time of the original fright situation the ego libido investment of the suffering organ creates a beneficial distribution of libido and thus prevents the traumatic neurosis. In other words the overwhelming impression created by the wound and its attendant threat to life throws up an impermeable barrier against other stimuli.

Freud further modified the principle that all dreams are wish-fulfilling in character, because of the tendency of the patients suffering from this neurosis to dream repeatedly of the terrifying incident.

My own views on the subject differ somewhat. Accepting all the factors in the production of the neurosis, it seems to me that he disregards certain other factors which enter into it which we know from experience to exist. For instance, the element of neurotic temperament. Most of the cases which I examined during the war showed evidence of having had many of the characteristics of this

type of personality before the onset of the traumatic difficulty. Other elements which may enter in are prolonged anxiety, impossibility of adjustment to an intolerable situation, and extreme fatigue.

I examined a young aviator at Camp Funston who had been shot down from a height of 1,500 feet by an enemy plane with which he was exchanging fire. He was aware of the danger before the actual casualty took place, and remembered what took place as the plane shot toward the ground until the last few feet. Fortunately, the plane caught in some trees and he escaped with a fractured arm and dislocated shoulder. Here both anxiety preparation and an organic wound occurred and yet he suffered from an exceedingly severe traumatic neurosis. I believe that this was due to a terror so overwhelming that it broke through all of his defenses. Therefore the anxiety preparation is only effective within limits and neither does the major wound invariably prevent the neurosis.

The fifth stage deals with the unconscious part of the ego as a hypothetical consideration. Its conjectures are of an entirely abstract nature and have little practical importance excepting as they help us to a better understanding of the practical workings of the actual psychoanalytic method, its limitations particularly.

Psychoanalysis as a procedure is an inquisitive delving into the psychological processes. The object of the search is to bring to light some repressed and forgotten events which might have had a profound influence not only on the production of the present mental derangement of the patient but upon his character and personality. Provided the analysis is successful, the bringing of the repressed and painful thoughts back into consciousness is accompanied by an emotional outburst, the so-called mental catharsis. Theoretically this should cure the patient of his disorder and sometimes it does. Not infrequently the outburst is followed by an indescribable feeling of relaxation and relief. Then only too often the symptoms return. Repetition of the catharsis may serve to effect a cure, even if no new matter is brought to the surface. However, there will be a certain number who will remain uncured if the treatment be abandoned at this point. The knowledge of habits, responsive reaction and the estimation of personality with a view to taking measures to remedy any faulty adjustments in the life regime of the individual certainly has not been overlooked by psychoanalysts, for they were among the earliest to recognize that these habits were due to the nervous condition, the cause of which they have striven to remove. The next logical step is to remove the habits. In other words, while the strict Freudian procedure limits itself to the ferreting out of the cause it must be and is admitted by psychoanalysts, that the procedure so limited would in many instances be incomplete. But psychoanalysts deal not only with the cause of the neurosis but with the effect, for a neurosis is never without its effect on the personality of the individual suffering from it.

There are certain symptoms common to all neurotics and in addition to the usually described ones of nervous tension, irritability, inability to concentrate the attention, lack of interest, depression of variable depth, an appetite for sympathy and easily aroused emotions, certain traits of character stamp the neurotic.

Freud, generalizing on the subject, believes that sexual traumatism interfered with the dominant tendencies in the mental life of the neurotic and that the individual's defense against this interference constitutes the neurosis. This means essentially that the interference lies principally with expression, creation or accomplishment on the part of the patient.

Therefore, the neurotic personality is an inactive and an imaginative one. The ability to create tense situations is to my mind one of the outstanding features of neurotic's personality. The novels of Joseph Conrad, in which the interest is sustained by the author's ability to picture all of the mental striving, weakness, anguish and various psychological difficulties of his principal character under disastrous circumstances, afford an excellent example of the working of such a neurotic mind plus the power to express itself magnificently.

The neurotic pictures to himself all of the difficulties in a task and then too often doesn't perform it. Day dreaming replaces action. These fantasies not only replace action but they serve to fill in some flagrant defect in character. He often pictures himself to himself as the kind of man he would like to be but isn't. The indulgence in fantasies leads to inactivity, and consequent lack of force, initiative and aggressiveness. Postponement of action leads to inability to arive at a decision and a passive attitude towards situations which call for action. This indecisiveness may be carried

from the very greatest to the most inconsequential acts—or again indecision may be replaced by attention to unimportant details. The picture of King Louis the Sixteenth planning a lock for the cabinet to hold his jewelry while the revolutionists are deciding to dethrone him and kill himself and his family has always impressed me as a particularly illuminating phase of dawdling. Timidity, lack of enterprise, overscrupulousness, idling, time wasting, introspection and moping are other manifestations. Dreamy states with the accompanying sensation of unreality are frequent and, in my opinion, are due to lack of attention to the stimulus of events from the outside world, introspection and perhaps unconscious striving to place the disagreeable reality as a whole out of mind—in other words, to recall the unconsciousness of the sleeping state. Reflex memory stimulated by half familiar phrases or situations may also bring it about.

In effect, timidity, irritability, introspection, lack of color in personality and hypersensitiveness make the neurotic an unsociable being, while too much solicitude, or lack of patience or understanding on the part of the family, usually completely isolates him from both society and family. Adler.[2] in his Individual Psychology, has wrestled with this phase of psychoanalysis. In this country, contemporaneously, Sidis,[3] Morton Prince,[4] White[5] and others had entered on it from the purely descriptive side and in addition suggested the rather obvious readjustments to overcome the social and family faults. The National Committee of Mental Hygiene has been responsible for the large program of installing psychiatric clinics throughout the country in an attempt to recognize earlier and follow more closely cases brought before them. One of the most interesting lines of investigation, and one which seems most pregnant of good, is the branch of mental hygiene dealing with the guidance of children, and various Child Guidance clinics have been established, with a view to earlier recognition and prevention of the development of personality and conduct disorders.

While psychoanalysts are primarily interested in abnormal psychology, the necessity for knowledge of normal personality as a means of judging abnormal types is at once apparent. The tendency of many interested persons has been to divide all men into two groups. These have been called by various names. William James' division[6] of the "tough" and "tender" minded men is suggestive. The "tough" minded being the realists who demand the facts of life and act on them; the "tender" minded ones the classicists capable of abstract contemplation. More recently, Jung,[7] Kretchmer,[8] Bleuler[9] and Brill[10] have again depicted two well marked types. The first type is the independent, self-contained, self-sufficient person. Association with people is not a necessity with him, nor is it necessary for him to display any sort of emotionalism. He is constantly striving along new paths of endeavor and never satisfied to travel the well-trodden ways. His productions are usually unfrequent, but his trend is toward perfection. He has little liking for people, uses them indiscriminately and influences them without any understanding or particular attachment to them. George Washington, who has been described as silent, thoughtful, and little disposed to conviviality, seems to afford the example of this type. So does Woodrow Wilson in our own day. Brilliant, forceful, intensely egotistical, able to influence people without being close to anyone; friendly with people as long as they were useful, but discarding their friendship unscrupulously if they did not conform to his needs. This type corresponds to the egocentric individual described by Freud. The opposite type is essentially a social being. His feelings influence his thoughts and actions. His interests lie with people and he is usually good company and lovable. He reacts adequately to every emotional situation. He is lively and animated. He is domestically and socially a success, because he understands and cares for his fellow beings. Sir John Falstaff is the type. These brief sketches designate two personalities. One emotionally unresponsive, and the other expressing his emotion as he feels it.

Independence of thought and action combined with the ability to repress emotion and hoard energy give to those endowed with good intelligence and the necessary perseverance an inestimable ascendency over the opposite type.

The emotionally responsive individual's attributes fit him to be a part of the masses. While these emotional characteristics are in general quite aside from the individual's power to accomplish, the sphere of accomplishment will be more or less designated by the type of personality. The social being, interested as he is in people and their entertainment and comfort, might be expected to prefer such things as would add to the welfare of the people. They are the musicians, artists, story tell-

ers, physicians and architects; the socially amenable and the upholders of law and order.

The independent unresponsive type is fitted temperamentally for affairs rather than people; consequently, it is more easy to designate people of prominence among them. Rulers should be of this temperament. The Nordic strain has a preponderance of the emotionally unresponsive in it, but even among the Nordics, geographical and climatic conditions seem to influence the type.[4] The affable pleasure-loving southern gentleman and the penurious monosyllabic Puritan were both from England. It is easy to imagine either one of these types being subject to normal or exaggerated fits of elation or depression. For example, Abraham Lincoln's reactions are said to have been unresponsive and it is known that he suffered from prolonged spells of melancholia. Likewise, in dealing with abnormal minds the personality of the individual undoubtedly influences the production of symptoms in a given case.

In a paper of this sort it is impossible to do more than outline some of the considerations entering into such an animated, vigorously developing subject as psychoanalysis. Inconsistencies must be present in the delineation of such a pioneer field. This, however, is not to be deplored, for, as someone has said, "The only truly consistent person is a dead person," and psychoanalysis is nothing if not alive.

BIBLIOGRAPHY

1. Wertheimer, F. I.: Development of metapsychology. Arch. Neurol. and Psychiat., 1924, 12, 547-553.
2. Adler, Alfred: Praxis and Theorie Individualpsychologie. Verlag Von Bergman, Munchen, 1920.
3. Sidis, Boris: Multiple personality. Jour. Abnorm. Psychol., 1907, 2, 93.
4. Prince, Morton: My life as a dissociated personality. Jour. Abnorm. Psychol., Vol. 3-4-5, 1908-9. Also: The unconscious, New York, MacMillan, 1921.
5. White, Wm. A. Mechanisms of character formation. New York, MacMillan, 1920.
6. James, Wm.: Pragmatism. Longmans, Green & Co., 1921, p. 12.
7. Jung, C. G.: Psychological types. Keegan, Paul. London: Trench, Trubner & Co., 1923. Translation by H. G. Baynes.
8. Kretschmer, M.: Uber Korperbau und Charakter. Berlin, Springer, 1921.
9. Bleuler, E.: Die Probleme der Schizoidie und Syntonie. Zietschrift fur die Gesamte-Neurol. und Psychiatrie. 88, 4-5.
10. Brill, A. A.: Schizoid and syntonic factors in the neuroses and psychoses. Am. Jour. Psychiat., April, 1925, p. 589.

X-RAY AND METASTASES IN BREAST CANCER*

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Beginning with the year 1918, when the medical literature contained a large number of references to the use of *x*-ray both in preoperative and postoperative cancer of the breast, and not having been satisfied with the results obtained previous to that time from this dreaded disease, I began to keep a more accurate record of all cases operated on by myself as well as by several of my colleagues. We were all of the opinion that possibly the use of *x*-ray would have a tendency to either cure or delay the fatal results in cancer of the breast. I am frank to state that previous to 1919 I was discouraged with the results obtained in these cases. At the present time I am more discouraged than ever at the results of the so-called "cure" of breast cancer patients who have been operated upon by myself and my colleagues. A careful study of these cases has also brought forcibly to our attention the many avenues of metastasis that may occur in breast cancer.

Of the ten patients operated upon in 1920, eight are dead, two are living, but have recurrences. Of the seven operated in 1921, five are dead, and two have recurrences. Of the nine operated in 1922, eight are dead, none have recurrences and one is living. Of the eight operated in 1923, two are dead, two have known recurrences, and four are living and well. Of the seven operated in 1924, five are dead, two are living, no recurrences. Of the six operated in 1925, one is dead, four are living, and two have recurrences.

This totals forty-seven cases in the five-year period. Twenty-nine, or sixty per cent, are dead. Six, or 10 per cent, are living with known recurrences. Fifteen, or thirty-one per cent, are living. Of the fifteen living, eleven were operated within the two-year period.

Of those dead, all except two died from cancer metastasis. The one exception died from lobar pneumonia which we were able to prove was a metastatic affair, and the other died of a long standing diabetes.

Of those living with recurrences, one recurred in

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the skin on the operated side, two have carcinoma in the opposite breast, and two have recurred in the supraclavicular glands of the neck, and one in the spine.

Fortunately, there are a few still living without any signs of recurrence, but the five-year period has not yet passed for them.

A review of these statistics certainly is not encouraging.

The type of operation used in all these cases was the radical operation, with two exceptions. By "radical," I mean removal of the pectoral muscles, major and minor, removal of the wide areas of skin and breast tissue, removal of the fascia down to the ribs and that extending up to the clavicle, removal of the axillary glands and gland-bearing area.

Eighty per cent of these cases had a preliminary treatment over the breast and the gland-bearing area in the axilla with *x*-ray, the average dose being: 5 milliamperes, 110 K.W., 9-inch spark gap, 10-inch focal distance from the skin, 5 mm. aluminum filter, 15-minute treatment.

Operation followed at varying periods from two days to one week following the initial dose of *x*-ray.

Ninety-five per cent of all cases have had postoperative *x*-ray therapy, the treatments varying from two to as high as twelve, in varying periods from two to three weeks apart. In some, the dose has not been as great as in others, but the above-mentioned dosage has been attempted as a standard. Marked nausea and so-called "*x*-ray sickness" sometimes interfered. In fact, this dosage of *x*-ray was to many of the patients decidedly disagreeable, and it was only by considerable persuasion and, of course, in the hope that the treatment would be decidedly beneficial, that we were able to prevail upon many to continue with the treatment.

It is admitted that this dosage of *x*-ray is not the maximum dosage that can be delivered, but it is an average that can be obtained from the ordinary machine. My observations of the deeper *x*-ray therapy on the patients of others has not made me believe that the results are any better than those here reported.

The observations of Tichy, as reported by Davis, are indeed illuminating and I quote:

Group 1: The cases treated during the years 1904-1914 were not *x*-rayed after operation.

Group 2: The cases treated during the years 1914-1917, scar *x*-rayed lightly after operation.

Group 3: The cases treated during the years 1918-1919, intensively *x*-rayed after operation.

Table 3 gives the results at Marburg reported by Tichy, the results at Tubingen reported by Perthes, and the results in Parry's Clinic at Leipzig as reported by Kastner, all using the same groups.

As will be seen by studying the table the most unfavorable results were with the cases intensively *x*-rayed. It was especially noted that more cases died of metastases and the internal metastases were more numerous and very marked among those *x*-rayed intensively.

In our series we have never before observed such apparent rapid metastasis, and metastasis into so many portions of the body, as this little study has revealed. Again quoting Davis: "In my own experience for a number of years the *x*-ray has been used postoperatively in most cases, but I am not yet convinced that it adds to the chance of cure and in some cases it has seemed to be detrimental."

Our observations on metastasis have confirmed those of Handley as to the avenues of invasion. These avenues of metastasis are:

(1) The axillary glands; (2) into the clavicular chain of glands; (3) into the chest wall and mediastinum; (4) into the peritoneal cavity; (5) local recurrences in the skin; (6) into the bony or skeletal part.

Our series show that 95 per cent had axillary involvement before operative interference. These cases, however, were operated, being well aware of the fact that much has appeared in the literature advising against removal when the axillary glands are involved. I am, however, certain that if the axillary glands are involved, one may at least operate. We have observed that in those with axillary involvement, that were followed with *x*-ray treatment, especially into the axilla and over the breast area, only 2 per cent have had recurrences in the axilla of the side that was operated upon.

There were four cases in which there was metastasis into the clavicular group of glands, either subclavicular or supraclavicular. The more recent literature tells us that these cases should not be operated upon under any circumstances. Our observations have led us to believe—although we have operated upon these cases—that the opinion not to operate is much better than to operate, because these patients in whom we have found supraclavicular glands, in spite of the intensive *x*-ray

treatment, have rapidly become worse and shown metastasis elsewhere.

Metastasis through the chest wall to the mediastinum and lungs has been observed in only two cases. These were, however, cases in which there was lung involvement demonstrated, and whether they were primary through the chest wall, or whether they were due to malignant emboli or metastasis from some other source, we were unable to determine. However, we had no cases in which there was known metastasis through the pleura.

Carcinoma in the opposite breast occurred in two cases of the series, one of these being in a nursing mother.

There have been four cases in which carcinoma later developed in the liver, but these were also associated with metastasis to other parts, so we have been unable to determine whether the liver involvement was secondary to the breast involvement, or whether it was secondary to a metastasis that already had taken place in other parts of the body.

Local recurrence in the skin has occurred in only one case. Our observations previous to 1920 showed that local recurrences to the skin occurred comparatively frequently, but I am of the opinion that the treatment with *x*-ray has undoubtedly retarded the occurrence of metastasis in the scar or in the skin over the removed area.

Metastasis in the skeletal bones, especially the spine, the pelvis, and the heads of the femurs, in this series have been most prominent.

Pain in the hips, in the pelvis, or in the back, after an operation for carcinoma, even before definite evidence can be found by *x*-ray, is a very characteristic sign of metastasis. This pain is very persistent and intense. More particularly is this true in cases of spinal metastasis. The frequency with which metastasis into the skeletal parts has been observed in this series, certainly leaves the impression that our use of *x*-ray seems to have scattered metastasis to remote parts rather than to have retarded it as we had hoped.

In the order of frequency, metastasis has occurred in the head of the femur, ilium, spine, sternum, the ribs, skull, and the lower jaw.

We have not yet seen a case of metastasis in the skeleton below the head of the femur.

The treatment of metastasis, especially in the skeletal parts, by the use of *x*-ray, has not been satisfactory. Prompt and better results are recorded by the use of high voltage dosages, when the pain only is said to be relieved.

Metastasis into the skeletal parts can only be determined by repeated *x*-ray pictures of the parts suspected of involvement, and in the early stages only by the closest scrutiny.

It is generally agreed that the degree of malignancy in carcinoma is due to the type of cell found in the tumor. Tumor masses showing hyalinization and fibrosis generally develop less rapidly, while those containing cells of a more embryonic type speak for a shorter life. The unknown quantity of the degree of resistance of the patient must also be taken into consideration. These facts have been well shown by McCarthy and Sistrunk, in a very admirable work. It is generally recognized that the size of the tumor in the breast is of no particular prognostic value, but that the involvement of palpable glands decreases the chances of a favorable outcome more than one-half.

All of the cases operated and reported here have had pathological examinations by competent pathologists. Those found to be of the scirrhous type have lived longer than those in which there was marked mitosis.

As one grows in experience, one comes more to the belief that it is better to give the patient the benefit of the doubt and remove all fibromas, cystic mastitis, so-called "lump in the breast"; this is a much safer procedure than to allow them to remain until a gross diagnosis of cancer can be made. In spite of all the cancer propaganda, there still remains a large number of people of average and more than average intelligence who come "too late" for the best results.

Also, one must come to this conclusion: When metastasis has taken place, the cancer has undoubtedly spread beyond the control of the surgeon, and one must conclude that these patients would be far better off without operation. It takes more courage to refuse to operate than to say operate.

Our observations would show us that, in view of the fact that skeletal metastasis is so common and when once found the prognosis is hopeless, it is surely better practice in all cases of breast carcinoma to take roentgenograms of the ilium, head of the femur and the spine. If metastasis is found, it would be very much better to refuse to operate and to attempt to treat palliatively, and I feel sure that the ultimate outcome will be as favorable, if not more so, and that life will be prolonged by such a procedure.

Our observations also convince us that the use of *x*-ray preoperatively and postoperatively certainly has not shown the results that were hoped and expected of it, when this series began. Whether the dosage has not been sufficient, remains an open question. I am becoming more and more convinced that postoperative *x*-ray treatment is only effectual in preventing local recurrences and relieving pain, and that from clinical experience it does not prevent metastasis but has a tendency to scatter metastasis and hurry the end.

DISCUSSION

Dr. J. F. Corbett, Minneapolis: I want to thank you for presenting this paper. The only fault I can find with it is its brevity. It has suggested so many things to me. The whole paper was so full of inspirations that I hardly know where to begin the discussion. The thing that struck me first was this: That we are getting these cancers too late. I do not believe this is entirely the fault of the patient. Too many of them are operated at a late stage when they should have been operated early. Delay is not a good measure with cancer. Some cancers grow with extreme rapidity and some are very slow in growing.

I will have to confess a rather humiliating experience I had about the first of the year. I very carefully removed a tumor from a brain. It was not connected with the bone in any way. It came out so nicely and so easily that it aroused my suspicions that it was a metastatic tumor. I had it examined and it was a metastatic tumor from the breast. I examined the breast and found a nodule hardly as large as the tip of my finger that I removed simply for the purpose of diagnosis and found it to be a carcinoma. Now as humiliating as this experience may be, it nevertheless shows that we do get metastasis very early from very insignificant breast tumors. More than once I have been called to treat a fractured femur that I found was a pathological fracture and was due to tumor in the breast that had been overlooked both by the patient and by the physician.

Now in regard to diagnosis. It has been my habit in all tumors of the breast whether in young women or women of the cancer age when I am the least bit suspicious to remove a good-sized piece from the breast and have a microscopic examination made. It may be that at some time this procedure will be subject to criticism, but I believe it is the safest thing to do. One has to be careful to go very wide of the tumor and if at all suspicious, to remove a wedge-shaped piece from the breast. A cautery is recommended for this.

In regard to the question of the *x*-ray, I think I may be permitted to illustrate it by reporting a single case. This was a young woman who had a small tumor removed from her breast. It was examined and found to be carcinoma. For some unexplained reason, possibly the mental condition of the patient or something of that kind, no other operation was done. The young woman was given a long course of *x*-ray treatment. Finally the tumor became very obvious in the breast and I was asked to remove that breast. Sad to say, I did. I could find nothing in the axillary glands. The tumor had returned locally and a very extensive dissection was made and I took everything that possibly could be taken out of the patient's anatomy. In the portions most remote from original site, cancer was found, but nothing in axillary glands that had been treated with *x*-ray.

That patient in a few months developed metastases in the lungs, in the vertebræ, and every place that she possibly could. Now what did the *x*-ray do there. It did not influence the primary growth. We are told that *x*-ray must either kill or stimulate the cancer cells. It apparently held the cancer in check in the glands it could reach but did not control the cancer at the original site, where cells were assumed to be numerous. Deep *x*-ray therapy is found to make the patients sick. They vomit and feel miserable and I have yet to see a single victory from any of my cases where we have used the deep therapy. I think this: *X*-ray probably is in its infancy and we have not yet knowledge sufficient to either condemn or approve it.

Surgery in later stages of cancer cannot claim many victories and is still developing. I believe the same is true of *x*-ray therapy.

Dr. James Hayes, Minneapolis: At the meeting of the Post-Graduate Assembly in St. Paul, I was much interested in and somewhat surprised at some of the facts brought out in that very exhaustive review of carcinoma of the breast. The statistics concerning the therapeutics of this condition corresponded very closely with those presented to us by Dr. Coventry this evening.

It has been estimated that the average patient lives about three years from the time the tumor is first noted in untreated cases of carcinoma of the breast. With all the therapeutic measures we have at hand we are able to take but 30 per cent of those treated to the five-year period. This does not speak well for our present treatment of cancer of the breast. However, it is a decided advancement and we must put forth every effort to do better. Educating the public is not the greatest problem. They are fairly well educated now to seek medical aid early.

We in the medical profession should do better in the way of advising these patients. Dr. Coventry says 95 per cent of his patients already had palpable glands in the axilla. This is usually too late to cure these patients. We should recognize this condition earlier.

There is so much confusion yet among medical men that we frequently lead the patient to lose confidence in us because of our conflicting opinions.

This week we saw a young woman who had been advised by a prominent medical man to have both breasts removed at once because of the existing condition. She consulted another medical man. He told her there was no indication for surgery. We could see no indication for surgery. These cases are not conducive to gaining the confidence of the public; yet we see them very frequently. The medical profession should get together on so important a matter as this and establish some means of making it possible for every medical man to know how to advise these patients. Here, it seems to me, is the greatest field for advancement.

It has been suggested that a more radical operation be performed with the hope of curing these cases, such as removing the supraclavicular glands, some of the chest

wall or the umbilicus with the rectus muscle and fascia. This perhaps is poor advice, for we know in the great majority at least, the metastasis takes place in the axilla first. If the invasion has gone further than this, then it is only a hazardous guess as to the limits of the extension.

I don't pretend to compare my knowledge of pathology with that of Dr. Bell. But I am personally convinced that there is something in Broder's grading of malignancy.

Lee of New York some time ago showed a specimen of a carcinoma removed from the breast of an elderly woman. This was known to have been present for twenty years. At the same meeting he showed a specimen, or the picture of one, taken from the breast of a woman who died six months after the first appearance of the lump. Pathologists have not definitely explained this apparent discrepancy. Why can it not be explained according to this classification?

Perthes in 1920 aroused discussion as to the possible harmful effects of intensiye doses of *x*-ray in post-operative carcinoma of the breast.

In St. Paul, Portmann, in his review, showed that out of twenty-six clinics only three had given favorable reports, and those three had not used the intensive doses of *x*-ray. In their clinic at Cleveland, there was 16.5 per cent recurrence in the first year post-operatively in the patients not treated with *x*-ray, 29.3 per cent in those treated with light doses, and 35.1 per cent in those treated by intensive doses.

However, we have all seen many cases which are obviously inoperable cases, those with extensive pulmonary metastasis or other inaccessible masses which are greatly relieved, at least, temporarily, by *x*-ray treatment. It does hold out some hope for them and even if it does not prolong life, it does often give them some comfort while they do live.

Perhaps when the biological reaction to radiation is better understood, the results with *x*-ray in these cases will be much better.

Dr. Coventry, Duluth: When I said *x*-ray scatters metastases, I meant to say that in my observation those cases that have intensive treatment and radiation seem to develop metastases much more rapidly than those not so treated. Whether it is due to increasing the activity of the cancerous cell, which I do not believe, or whether it lowers the resistance of the patient and in that way cuts down the fighting power against the disease, I do not know, but the latter seems to be more reasonable. I believe that we are going to discontinue *x*-ray entirely or else use very light doses. I am also of the opinion that all cancers of the breast should be put into four classes:

1. Those cases that have a simple nodule in the breast without any evidence of metastases.
2. Those having a nodule with metastases in the axilla.
3. Those having metastases in the axilla and in the supraclavicular glands.
4. The inoperable cases.

I believe that when we classify our cases before operation in one of these four classes, after a period of years we will be better able to tell just what our final results are going to be and what we can offer our patients as regards cure.

ULCER OF THE DUODENUM*

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A great deal of interest has been manifested in surgical treatment of ulcers of the stomach and duodenum since the earliest period of abdominal surgery. In performing operations on the stomach we all feel an unusually great satisfaction when striking results are obtained. Medical students who aspire to become surgeons probably feel that, if they reach the point of performing operations on the stomach, they will have attained the height of their ambition. Coincident with this interest a great deal has been written on the subject, and principles have been formulated which have quite well standardized operative procedures.

Within the last few years, because of unsatisfactory results in certain cases, attempts have been made to show that the plan of performing gastro-enterostomy for ulcer is wrong, and that instead it is necessary to resect part of the stomach in order to get rid of the glands that secrete the acid and thereby get rid of the irritation and prevent the formation of secondary ulcers.

In considering the problems connected with ulcer it is first necessary to separate the gastric from the duodenal. The gastric ulcer may be malignant, and therefore in order to obtain a satisfactory result it should be excised and gastro-enterostomy performed if the gastric ulcer is small and situated high on the lesser curvature. Otherwise, the same result can usually be attained more easily by removing the part of the stomach which contains the ulcer and then completing the operation as a resection.

In the case of the duodenal ulcer the question of malignancy may be disregarded. Primary carcinoma of the duodenum that resembles an ulcer is almost unknown, and it is a great satisfaction to know, when prescribing a conservative treatment for a patient with duodenal ulcer, that we are dealing with a definitely benign lesion.

Ulcers of the duodenum are usually situated on the anterior surface in the cap. Occasionally, they are found on the lower border and rarely on the posterior wall, some distance from the pylorus, lying in the head of the pancreas. Because of their

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proximity to the pancreatic-duodenal vessels, ulcers in this location are frequently the cause of severe gastro-intestinal hemorrhages. I have often found multiple ulcers in the duodenum, but with more experience in these cases, I am inclined to believe that one of the ulcers is primary and that the others are secondary. It is not unusual, on opening the duodenum to excise an ulcer on the anterior surface, to find a small spot of puckering congested mucous membrane just opposite the anterior ulcer. I have excised many ulcers situated on the anterior surface and disregarded those on the posterior, which are much smaller and more like areas of duodenitis than true ulcers, but I have never known such a posterior lesion to cause trouble later.

Some years ago I called attention to the fact that lesions in the duodenum as seen in the operating room are of two distinct types. One type is a true chronic ulcer with a crater, which has lost a certain amount of mucous membrane, in every respect resembling gastric ulcer. The other type, which is very common in the duodenum and is usually spoken of as an ulcer, is, in reality, not a true ulcer but a localized area of inflammation. Both types of lesion occur in the same place in the duodenum, and for a time we thought that duodenitis was only the first step in the development of an ulcer, or that it was evidence that the ulcer was beginning to heal. It was difficult to correlate these facts, however, when a duodenitis was found in a patient who was in the midst of an attack at the time of operation and who had been having symptoms of ulcer for many years. The inflammatory type of lesion is not infrequently found at necropsy. Definite duodenitis can frequently be produced experimentally in animals by injecting bacteria cultured from peptic ulcers into the circulation, so all the evidence that can be accumulated seems to show that a lesion in the duodenum may at times be a localized area of inflammation, and not a true ulcer.

Many of the papers presented on surgical and medical subjects begin by saying that the etiology of the condition under consideration is not well understood, and yet the etiology is the most important factor and usually offers the most interesting study on the subject. If the etiology can be determined other considerations are quickly settled. Duodenal ulcers occur much more frequently in males than in females, and patients most often present themselves for treatment at middle age. I am convinced that Jewish people have a greater tendency toward duodenal ulcer than do the other races. This may be a result of their habits of life, the food they eat, or possibly some susceptibility to a type of bacteria which produces ulcer.

There is satisfactory evidence to show that physiologic activity has to do with the cause of an ulcer and that infection with certain strains of bacteria plays an important rôle. Mann has shown experimentally that a jejunal ulcer develops in practically every instance if the bile, pancreatic juice, and duodenal secretions are diverted into the lower ileum so that they have no influence on the jejunum, and if the jejunum is anastomosed to the stomach so that the secretions from the stomach flow directly into it. He has shown further that, after the ulcer has become chronic, as they all do, it will promptly heal if the normal continuity of the intestinal tract is re-established. The experimentally produced ulcer is in every respect like the lesion in the human being called the chronic ulcer. These experiments leave no question as to the physiologic factor in the etiology of ulcer; they would also seem to support the radical operation for duodenal ulcer as, in order to prevent recurrence, it is necessary to eliminate the irritation caused by acid secretions from the stomach. These secretions are supposed to come from glands in the stomach on the lesser curvature, and in the pyloric and mid-gastric sections. To determine the result of excising this part of the stomach, Mann performed a series of experiments in which he first set aside the duodenum as he had formerly, then removed a considerable part of the lesser curvature, pyloric, and mid-gastric parts of the stomach and anastomosed the remaining segment of the stomach to the jejunum; ulcers formed in the jejunum as in the former experiments. He believes that the acid secretion comes from the glands at the cardia, also, and that secondary ulcers will follow resection just as they follow gastro-enterostomy.

Striking results have been obtained by Rosenow from his studies on the etiology of ulcer. With bacteria from ulcers removed at operation, or from an infected tooth, tonsil, or prostate of a patient who has an ulcer, he can often produce duodenitis and ulcers in animals, and furthermore can recover the micro-organisms from the lesions. The fact that at certain times he has recovered the micro-

organisms from the ulcers produced experimentally by Mann would seem to show that bacteria play a part in the production of such experimentally-produced chronic ulcers. Moreover, the immunization of animals by bacteria from ulcer before Mann's experiment is carried out, seems, in some instances at least, to hinder the formation of ulcer.

While the etiology still remains the most fascinating part of the subject of duodenal ulcer, the great practical question at this time is whether a radical operation is advisable or necessary in order to obtain satisfactory results. The percentage of unsatisfactory results obtained by gastro-enterostomy has certainly been greatly exaggerated by those advocating the radical procedure. According to the most careful statistical studies, 5 per cent would represent the highest number of secondary ulcers that form after gastro-enterostomy, although one report gives a percentage as high as 34. No operation could survive with that number of unsatisfactory results. Some persons seem to harbor a predisposing strain of bacteria or have a break in their physiologic balance so that no matter what procedure is instituted a secondary ulcer forms, and it is likely that these cases are the ones that give the trouble. The magnitude of the operative procedure required to remedy a case of jejunal ulcer makes a lasting impression, and is probably responsible for the feeling among surgeons that the condition is more prevalent than it really is.

Gastro-enterostomy is not an ideal operation, but the results of gastro-enterostomy in most cases of duodenal ulcer are very gratifying, and the operation can be performed safely. For these reasons it should continue to be employed in many cases of duodenal ulcer. If excision of the ulcer with reduction of the sphincter activity can be performed just as safely as gastro-enterostomy, I believe this is the operation of choice.

The safety and ease with which an ulcer of the duodenum may be excised depends entirely on the mobility of the duodenum. If the upper edge of the duodenum is bound down as a result of inflammatory adhesions following penetration of the ulcer, it is usually not advisable to attempt to excise the ulcer. As the surgeon's interest increases in these cases he gradually finds that a larger proportion can be excised than he formerly though was possible. At the present time I am excising the ulcer in about 50 per cent of the cases.

The immediate results are very satisfactory, and usually the patient has an easier convalescence than after any other type of operation on the stomach. The ultimate result is very good; in more than 90 per cent of cases there has been complete and permanent relief from all symptoms.

The mortality must be kept as low as that following gastro-enterostomy. This can be done by not attempting to excise the ulcer in the cases in which the duodenum is too fixed. There has been no mortality from technical failure, but as in other types of operation on the stomach pulmonary complications have occasionally been encountered.

Ulcers do not perforate after gastro-enterostomy, but a number of the bleeding ulcers continue to bleed at intervals, and therefore I consider the radical operation preferable in cases of duodenal ulcer in which severe bleeding has occurred. There has been a wave of enthusiasm over the radical operation for duodenal ulcer, and the reaction that was bound to come has already begun to show itself. While Mann has shown that a dog can live quite happily after his entire stomach has been removed, and furthermore, that a small stump of stomach left after resection has a marked tendency to enlarge, nevertheless, most persons are unwilling to consent to removal of the stomach to obtain relief from symptoms resulting from a duodenal ulcer.

GONOCOCCUS VACCINE

It is probable that gonococcus vaccine in some form or other is still used by physicians in the treatment of gonorrhea and its complications. There is no question, however, that this practice is far less extensive than formerly. The use of gonococcus vaccine for curative treatment appears to be sharing in the decline from popular favor of bacterial vaccines in general. Gonococcus serum and gonoccus vaccine were omitted from New and Non-official Remedies because the Council on Pharmacy and Chemistry concluded that there was no evidence to show that these preparations had therapeutic value. (Jour. A. M. A., April 3, 1926, p. 1091.)

KAOLIN IN INTESTINAL DISEASE

For centuries Chinese physicians have used kaolin in fevers and intestinal disorders, including cholera. Recent experiments seem to confirm the scientific basis of its use. Work in vitro has demonstrated that it is not an antiseptic agent but that in fluid mediums, if kept in motion, kaolin will carry down with it large numbers of bacteria. More than this, it combines with the toxic products of cholera, of the typhoid dysentery group of organisms. and, apparently, with putrefactive and proteolytic bacteria. Recent workers have successfully employed kaolin in Asiatic cholera, bacillary dysentery, chronic ulcerative colitis and acute enteritis. (Jour. A. M. A., April 17, 1926. p. 1217.)

OXYPERITONEUM*

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The oxyperitoneum treatment of tuberculous enterocolitis consists of inflating the intraperitoneal space with oxygen.

The technic of this operation is very simple, being exactly the same as that used in the production of an ordinary artificial pneumoperitoneum for diagnostic purposes with the exception that oxygen is used instead of air.

It is unnecessary to previously prepare the patient by means of diet, enemata or laxatives. Almost any point on the anterior wall of the abdomen may be selected as a site for the operation. Dr. D. E. Holmdahl (Hygiea, Stockholm, Oct. 30, 1922) describes an improved technic for artificial pneumoperitoneum as follows: "The puncture is to be made in the left anterior axillary line, the patient lying on his right side, the shoulders raised a little. The needle is introduced just far enough down to escape the pleura, at about the eighth intercostal space. As the needle enters the abdominal cavity the manometer gives warning at once by the negative pressure."

However, my experience has led me to adopt a procedure almost exactly opposite to this. I have found it much better to select a location in the region of McBurney's point or in a corresponding region on the left side, for the reason that as soon as the oxygen finds its way beneath the diaphragm the patient will experience pains radiating to the shoulders, and the lower down the injection is made the more oxygen one can introduce before the patient complains of discomfort.

In females the abdominal puncture can be dispensed with by using the method of intrauterine abdominal inflation described by I. C. Rubin of New York in 1920. Rubin's method consists of introducing a metal catheter into the cervix and allowing the oxygen to flow through into the intraperitoneal space. In cases with closed tubes the oxygen will return alongside the catheter. After trying this method a few times I have abandoned it for the reason that all of the women on whom I have tried it complained of severe pain almost immediately after the oxygen started to flow. The pain, I think, was due to distention of the uterus and tubes, although it may have been due to the irritating action of the oxygen on the mucous membrane of the uterus and tubes, similar to or identical with the action of pure oxygen on the mucous membrane lining the trachea and lungs.

We usually do an oxyperitoneum with the patient in his regular bed, setting up the apparatus on a bedside table.

The instruments needed are a 10 c.c. glass hypodermic syringe with one very fine needle with which to anesthetize the skin and one larger needle with which to inject the deeper tissues, a very small knife and a pneumothorax needle connected by rubber tubing to a pneumothorax apparatus containing the oxygen.

The skin at the site of the operation is painted with either tincture of iodine or mercurochrome solution. The skin and all the tissues of the abdominal wall are anesthetized with a 0.5 per cent solution of novocain. The skin is then punctured with a small knife; the pneumothorax needle is then introduced into this puncture and pushed through the various tissues and into the intraperitoneal space. The oxygen is then permitted to flow until we think that the patient has all that he can retain without too much discomfort. In some cases this will be as little as two or three hundred c.c. and in others it will be as much as two or three thousand c.c. of oxygen. After the needle is withdrawn from the abdominal wall the puncture is sealed with a little cotton and collodion.

Of course, the technic must be varied at times to fit in with the various psychological and anatomical conditions of the patient. For instance, in some patients it requires considerable pressure to force the ordinary pneumothorax needle through the wall of the abdomen, and if these patients are unusually apprehensive it is better to use an extra long hypodermic needle of good-sized calibre when injecting the solution of novocain and to go right on through the peritoneum with it. The syringe can then be disconnected and the oxygen-carrying tube connected to the needle.

In extremely emaciated patients one should not attempt to make the puncture with the needle pointing directly to the patient's back because there is a possibility that the intestines may be pinned between the point of the needle and the posterior wall of the abdomen with no chance of escape. In such

*Read at the staff meeting of the Lymanhurst Hospital, Minneapolis, Dec. 15, 1925.

†Superintendent Lake Julia Sanatorium.

cases the needle should be pointed across the abdomen just before it goes through the peritoneum.

During the operation the intraperitoneal pressure may be determined by means of the manometer. As a rule we obtain a pressure of about plus 2 or plus 3 at the end of the injection, but we have produced pressures of plus 6 or plus 7. I do not think that it is advisable to produce a pressure higher than this for the reason that the patient may, even contrary to orders, attempt to get out of bed and thus produce a hernia where a "potential" one exists, or a certain rare complication may ensue such as has been reported in a patient following artificial pneumoperitoneum. In this particular case the patient raised erect and a sharp pain was felt in both sides of the neck which was followed by emphysema above the clavicles. Although very unusual, this is not serious.

One should not expect to obtain a reading of the pressure unless a needle of fairly large calibre is used, and the end of the needle is free in a pocket of oxygen.

The presence of oxygen in the abdomen can be determined for from ten days to two weeks, depending upon the amount injected. The presence of air in the abdomen has been reported three weeks after an injection of 2,000 c.c. (Dourre in Jour. de Radiologie et d'Electrologie, Paris, Aug., 1921). I believe that oxygen is absorbed much more quickly than air.

I know of no reason why the operation should not be repeated as often as is thought necessary, and I believe that to obtain the best results the injection should be repeated before all of the oxygen of the previous injection has been absorbed.

I do not know of any grave objections to this form of treatment, and, as yet, there has been only one objection suggested to me, and that was the possible danger of puncturing the intestines. Although I know of one case in which this accident happened, I think that it is little to be feared if the puncture is made in the manner I have outlined and if one is careful not to select patients who are very tympanitic from the presence of gas in the intestines. The many hundreds of times that the operation of producing artificial pneumoperitoneum for diagnostic purposes has been performed, with practically no deaths reported, would seem to speak well for the safety of the procedure. Besides the case which I have just mentioned in which the intestines were punctured, I have seen but one report of a death following the production of an artificial pneumoperitoneum. This case was reported by Dr. Benjamin S. Barringer of New York (Jour. Am. Med. Assn., Sept. 24, 1921). The patient, who had carcinoma, died some days after the inflation of the peritoneum. At the autopsy the patient was shown to have a generalized peritonitis. It was presumed that this patient was unusually susceptible to infection because of the advanced carcinoma.

None of our patients have had any unpleasant experiences during or after the inflations with the exception of the shoulder-pains previously mentioned, and discomfort on coughing in those cases in which an unusually high intraperitoneal pressure was produced.

For a day or two after the inflations some of our patients have noted a peculiar sensation in the abdomen when turning from one side to the other. This was caused, no doubt, by the intestines dropping to the lower side of the abdomen without the usual support of the abdominal wall.

The greatest advantage of this form of treatment for intestinal tuberculosis is that of immediate results. A very definite relief is usually obtained in from one to two days, whereas in other forms of treatment it is generally a matter of weeks or months before relief is experienced.

Of course, it is not quite so simple to do an oxyperitoneum as it is to prescribe a diet, give an intravenous injection of calcium chloride solution, or to prescribe heliotherapy, but the quick relief that is given to most of the patients is reward enough for what little effort the operation requires.

After more than three years' use of oxyperitoneum for the relief of distressing symptoms accompanying intestinal tuberculosis, I am of the opinion that it is one of the most useful procedures at our command.

We have had cases in which the oxygen was not successful in relieving the diarrhea nor the pain to any great extent, and in some of our most successful cases not every injection was followed by as much relief as we had hoped for, but in over 60 per cent of the patients treated, the relief experienced was very pronounced, and in some cases it was almost magical.

As we all know, the symptoms of intestinal tuberculosis may range from practically none at all, up to the most painful and distressing, and that sometimes the symptoms are in inverse ratio to

the amount of pathological involvement present. For this reason we have not been able to definitely decide as to the stage of the disease in all of the patients we have treated. Up to the present time our work with oxyperitoneum has been confined almost entirely to those cases with the more urgent symptoms, so that I am unable to report anything of value on the use of oxygen in the, presumably, early cases of intestinal tuberculosis.

Lately, since I have become more sure of the value of oxyperitoneum, I am using it in cases having the early or more mild symptoms, such as loss of appetite when combined with nausea, feeling of fullness, or colicky pains, with or without diarrhea.

The results we usually get from oxyperitoneum are relief of pain, nausea and vomiting, reduction in the number of bowel movements and increase in appetite.

As yet, I am unable to come to a definite opinion as to just why an oxyperitoneum is of such benefit to the patient. I rather think that the favorable results are derived from both the increased intra-abdominal pressure and from a direct chemical action of the oxygen.

Beneficial results are not always obtained in the same patient unless a fairly good supply of oxygen is injected into the intraperitoneal space; other parts of the body will not do. By way of proving this fact and at the same time testing for the presence or absence of a psychological effect of the operation, I have injected from 150 to 200 c.c. of oxygen into the peritoneal space, then, partially withdrawing the needle, have injected another 400 or 500 c.c. into the subcutaneous tissues of the abdominal wall to give the abdomen the usual appearance and sensation of fullness to which the patient has been accustomed; then, opening the by-pass in the needle, another 1,000 c.c. of oxygen has been allowed to flow into the air. The patient, watching the pneumothorax apparatus, is under the impression that he has received a good dose. Each time that I have tried out this experiment the patient has complained that the oxygen did not seem to "work so well."

It seems no more than reasonable to think that at least some of the beneficial effect of the treatment is due to a chemical action of the oxygen itself, because this element plays such a major part in the maintenance of all organic life.

James Todd, of Pittsburgh, who has been conducting very extensive experiments with oxygen on diseased animals for the past eight or nine years, says, "Oxygen enters into our bodies at both points of ingress, the stomach and the lungs, and it is of great significance that we find that nature chooses it as the only element to thus doubly enter our bodies. It is a fact of very great significance that nature, after she has expended the power of the elements derived from our food in maintaining our bodies, eliminates them always in combination with oxygen. The carbon comes out through our skin and our lungs as CO_2, the hydrogen as H_2O. Both elements are not only in combination with oxygen but are fully oxidized and are each held separately, as it were, in the grasp of their custodian, oxygen."

After reading Todd's report on his experiments with the effects of oxygen on guinea pigs that have been inoculated with tubercle bacilli, one cannot fail to be convinced that oxygen does vastly increase the disease-resisting powers of the body.

Patients sometimes say that they can feel their appetite increase almost immediately after the injection of oxygen. I believe that this increase in appetite is brought about in the same way that it is brought about by a ride of a few hours out of doors in the fresh air. That is, there is an increased supply of oxygen taken up in the blood and made available for the various functions of the body in which oxygen is needed.

No doubt, while the oxygen is fresh and under considerable pressure in the abdomen, much of it finds its way into the oxygen-carrying system of the body, and among other cells and organs benefited by it are the oxyntic glands, which are the acid-secreting glands of the stomach.

To support my opinion I will quote from Cohnheim, who says, "In muscular work which passes beyond the physiological limits and demands a greater supply of oxygen than is furnished, there is formed lactic acid and it seems that the resulting fatigue is due to the formation of organic acids. In the stomach hydrochloric acid is formed from the neutral blood from which it draws neutral acid ions, and this process tends to move the equilibrium toward the alkaline side. For this reason gastric secretion may be preventive of fatigue or the feeling of fatigue."

One of the products of combustion in the body is CO_2 and if sufficient oxygen is not at hand to complete the process, lactic acid is formed instead.

Lactic acid is an intermediate product of combustion when CO_2 is produced. Not only must there be a sufficient supply of oxygen on hand to complete the process of oxidation, but also a good supply of carbon, which is furnished by food—chiefly carbohydrates.

The above facts being true, it would seem likely that the feeling of increased strength that some patients experience after an oxyperitoneum may be due to the direct absorption of oxygen in sufficient quantities to prevent, to a certain degree, the formation of lactic acid, which acid would supposedly be present as a result of decreased oxygenation due to impaired function of the lungs and circulatory system. It would also seem likely that the patient's increased appetite may be a sort of by-product of this beneficent process, due to the increased amount of oxygen made available in the blood for the use of the oxyntic cells in their process of secreting the acid of the gastric juice.

Whatever the process may be, the improvement of symptoms is so great in a large proportion of the patients treated, that oxyperitoneum is well worth trying in all cases of intestinal tuberculosis with distressing symptoms.

TUBERCULENE, A FRAUDULENT CONSUMPTION CURE

Tuberculene has been exploited from Danville, Ill., by one Mrs. D. J. Murrmann, under the trade name Tuberculene Mfg. Co., as a "lung restorer." A fraud order has been issued against the Tuberculene Mfg. Co. debarring it from the mails. Tuberculene was a mixture of creosote, rock candy syrup, glycerin, syrup of wild cherry and coloring matter. In the trial, the government pointed out that creosote preparations had long been used in the treatment of certain symptoms in cases of pulmonary tuberculosis, but that it has been definitely established that they do not destroy the tubercle bacilli. (Jour. A. M. A., Apr. 3, 1926, p. 1089.)

BISMUTHAL OMITTED FROM N.N.R.

Bismuthal (Langley & Michaels Co., San Francisco) is a mixture containing an insoluble bismuth citrate and pepsin as its active ingredients, with hydrochloric acid and lactic acid to protect the pepsin. It was accepted for New and Non-official Remedies in 1909, when an extended clinical practice of prescribing mixtures of a bismuth preparation and pepsin justified its acceptance. During recent years, the prescribing of pepsin in combination with other therapeutic agents has been generally abandoned. The Council omitted Bismuthal from New and Non-official Remedies on the ground that the routine combination of a bismuth compound and pepsin in the form of a stock preparation is not in the interest of rational therapy. (Jour. A. M. A., April 17, 1926, p. 1233.)

MASSIVE COLLAPSE OF THE LUNG*

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Massive collapse of the lung is a shrunken, airless condition of a part or all of one or both lungs, occurring suddenly after operation or injury below the neck, without the direct application of external force, or demonstrable obstruction of the air passages. Essentially, it is the same as pulmonary atelectasis, which has been well recognized, both pathologically and clinically, for many years. It differs only in that its onset is abrupt, that it usually is lobar in distribution, and that it is intimately associated with some form of trauma.

In 1908, W. Pasteur[1] first called attention to atelectasis of the lungs following abdominal operations, although he had observed in 1890 a similar condition in cases of post-diphtheritic paralysis of the diaphragm. He noted collapse of the lungs at autopsy in cases of peritonitis with abdominal operations. By careful examination, he was soon able to demonstrate this phenomenon, clinically, in a large number of post-operative cases, and he described it as a frequent post-operative pulmonary complication. A similar case had already been reported by Barr[2] in 1907. In 1914, Elliott and Dingley[3] reported a group of similar cases and discussed the etiology in detail. During the war, a similar pulmonary accident was observed by Bradford[4] and others. They noted the development of the physical signs of effusion following bullet wounds of the chest. Paracentesis was done, but, contrary to expectations, no blood or other fluid could be recovered. They soon discovered cases in which the physical signs appeared on the side opposite to the wound; often the same signs were present when there was no penetration of the chest wall by the missile. They then observed a displacement of the mediastinum toward the side of the lesion, rather than away from it, as should occur in hemothorax; the diaphragm seemed to be displaced upward rather than downward, as in pleural effusions. They concluded that they were dealing with massive collapse and thus added a group of post-traumatic cases to the post-operative

*From the Department of Roentgenology of the Minneapolis General Hospital. Presented before the Minnesota Pathological Society, Jan. 19, 1926.

cases previously reported. Post-mortem studies in some of these cases confirmed their findings.

The first case reports in this country were made by Scrimger[5] in 1921. Since then there have been numerous reports from different clinics, notably by Hirschboeck,[6] Scott,[7], Jackson and Lee,[8] and Churchill.[9] The literature is so completely reviewed in the last three papers that it need not be further dealt with here. In spite of these contributions, the etiology is still obscure, the pathology is not yet well understood, and this entity is entirely unknown to many competent surgeons and clinicians.

Pasteur[1] thought the collapse of the lung was due to paralysis or at least immobility of the diaphragm. Elliott and Dingley[3] put forth the theory that it was due to bronchial obstruction. A complete review of the various theories and the experimental work is given by both Jackson and Lee,[6] and Churchill.[9] It would appear that the most reasonable explanation is that elaborated by the former: that it is due to a combination of respiratory immobility and bronchial obstruction, the latter being the result of the former. The restriction of respiration and diaphragmatic movement which follows an abdominal operation causes an accumulation of bronchial secretions which dry and form a plug. The latter acts as an obstructive foreign body which, in the presence of an intact circulation, will cause atelectasis. The close resemblance of massive collapse, both clinically and pathologically, to the atelectasis which follows complete bronchial obstruction by a foreign body, serves to support this theory. In addition, Jackson and Lee cite a case in which bronchoscopy was done and a plug removed with subsequent clearing of the collapsed lung.

Bradford's description[4] of the pathology is comprehensive. Grossly the lung is shrunken, heavy, does not crepitate, appears congested, is airless. There may be fluid in the bronchi. On microscopic examination the alveolar walls are collapsed against each other, the alveoli being obliterated. There is no exudate, no invasion of leucocytes, simply shrunken lung tissue. It is apparent that the ingress of air has been interfered with; the circulation remaining intact, the air is absorbed by the blood and the lung gradually shrinks down; as a result of the decreased intrathoracic pressure, the diaphragm on the affected side moves upward, the mediastinum moves toward the affected side. The opposite lung becomes emphysematous and tends to push the mediastinum more toward the affected side.

The condition occurs most frequently following abdominal operations. It may occur after operation or injury to the body anywhere except in the head, neck, or upper extremity. The onset usually occurs in twenty-four to seventy-two hours after the trauma, and may be sudden with pain, dyspnea, tachycardia, cyanosis, and fever. In these fulminating cases, it closely resembles pulmonary embolism. Most often, the onset is slow and the dyspnea and cyanosis are the most prominent findings. Fever of rather low grade is always present and there may be leucocytosis. The patient rarely looks very toxic and may consider himself well. In a small percentage of cases, there are no symptoms, the abnormal condition being discovered on routine physical examination. Expectoration may occur but it is usually late and it has been noted that recovery may commence shortly after the bringing up of large quantities of muco-purulent sputum. The clinical course is most frequently mild, lasting three to six days, the temperature not going above 102° F., and terminating by lysis. In some cases the temperature is present for only a few hours and the findings clear up with great rapidity. A few cases have been reported in which alternating collapse and expansion occurred over a period of weeks, the whole course lasting several months. It is notable that no case of unilateral collapse without complications has ever proved fatal.

Pneumonia may be a complication as shown by the appearance of rusty sputum, higher temperature, toxicity of the patient, and a distinct change in the clinical course. Pleural effusion has also been reported as a complication, but it is probable that there was a preceding pneumonia in these cases.

The physical signs usually suggest pleural effusion or early pneumonia; cyanosis is prominent; asymmetry of the chest with flattening and immobility of the affected side may be observed. There is marked dullness on the side of the lesion, tympany on the opposite side. The breath sounds are usually suppressed, but may be bronchial at times. Bronchial râles may occur late in the course of the disease. If the left lung is affected, the high diaphragm may be detected. If it is on the right

side, the displacement of the heart and trachea to the right can be made out.

Pneumonia is the most frequent clinical diagnosis in the presence of massive collapse. The differential factors are the lower temperature, more marked cyanosis, atypical physical signs, lack of toxicity of the patient, and the displacement of the mediastinum. Pleural effusion is differentiated chiefly by the fact that the heart and trachea are displaced toward the side of the lesion rather than away from it; the diaphragm moves upward instead of downward. Pulmonary embolism, acute lung abscess, dextrocardia, acute dilatation of the heart, and pneumothorax on the opposite side, are frequent mistaken diagnoses; their differentiation is obvious.

The best diagnostic method is the roentgen examination. The diagnosis may be made by this means alone, as will be shown in the cases reported here, or it can be definitely confirmed in this way, when suspected clinically. The physical examination of post-operative patients is beset with difficulty. Movement is painful; frequently the posterior chest cannot be examined at all; the position of the patient may make asymmetry and immobility of the chest, movement of the diaphragms, and displacement of the mediastinum impossible to demonstrate. The roentgen examination with a bedside machine is a simple procedure, as we have demonstrated in a very large series of acute lung conditions at the Minneapolis General Hospital. There is much less disturbance to the patient in taking a film in this way than on a physical examination, and the results are usually clear-cut and diagnostic.

The chief *x*-ray findings in post-operative massive collapse have already been described by Holmes.[10] There is opacity of more or less degree obliterating a lobe or a whole lung, frequently of rather mottled character. The diaphragm on the affected side, if it can be distinguished from the shadow of the lung, will appear high. The heart and trachea can easily be distinguished and are displaced toward the side of the lesion. The latter is by far the most important finding, as it serves to differentiate all the acute conditions with which this entity may be confused. It should be emphasized that the only acute condition, in which there is immediate movement of the mediastinum toward the side of the lesion, is complete bronchial obstruction, by a foreign body. This can usually be ruled out with ease. Chronic lung fibrosis or chronic fibroid tuberculosis may produce a somewhat similar roentgenogram, but the

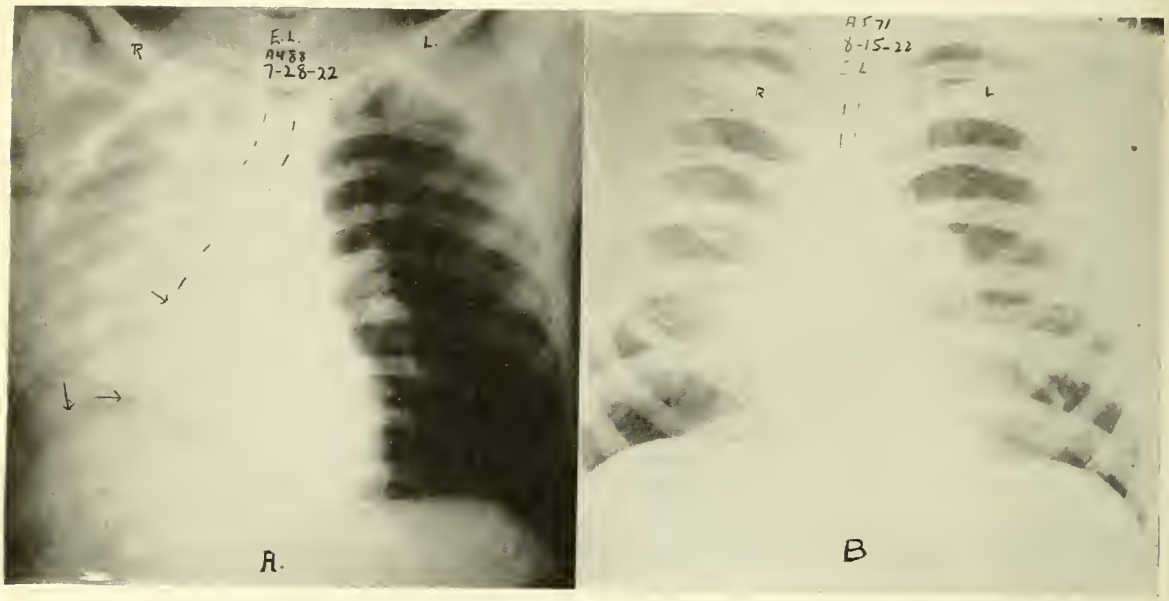


Fig. 1, Case 1.

A. Roentgenogram taken seventh day after onset. The mottling of the right lung, the high right diaphragm, and the displacement of the heart and trachea to the right should be noted. The arrows indicate the right diaphragm and the right border of the heart.

B. The appearance before discharge. Note the clear right lung and the normal position of the mediastinum.

condition is obviously not acute and the displacement of the mediastinum is permanent. Repeated *x*-ray examination in massive collapse will demonstrate the gradual replacement of the mediastinum to its normal position, indicating the temporary character of the movement. By the roentgen method, the clearing of the collapsed lung may be beautifully demonstrated on repeated examination; a clear concept of the changes taking place may be obtained.

Two cases of massive collapse of the lung following operation and trauma have occurred at the General Hospital in the past six months. We have been able to diagnose both of these roentgenologically. Since the observation of these two cases, we have examined the records at the hospital for the past few years to determine whether any cases have occurred which may have been overlooked. For the purposes of this study an adequate *x*-ray examination has been used as a criterion in the selection of cases. In order that the roentgen examination should be considered adequate, at least one film must be obtained during the course of the disease and at least one must be obtained either before the onset or after the disappearance of the symptoms. The object of the latter is to rule out the possibility that the displacement of the mediastinum was due to some previous condition. In view of the fact that collapse is said to be associated with lobar pneumonia, these cases were also reviewed. We have found 285 cases of ordinary pneumonia, without any previous history of trauma, which have been adequately studied with the *x*-ray. In this group there were two cases, or less than 1 per cent. in which collapse of the lung could be demonstrated. There were forty-eight cases of post-traumatic or post-operative pulmonary complications which had been adequately studied with the *x*-ray. In this group were found eight cases of undoubted massive collapse or approximately 16 per cent. These, together with one other, are reported here.

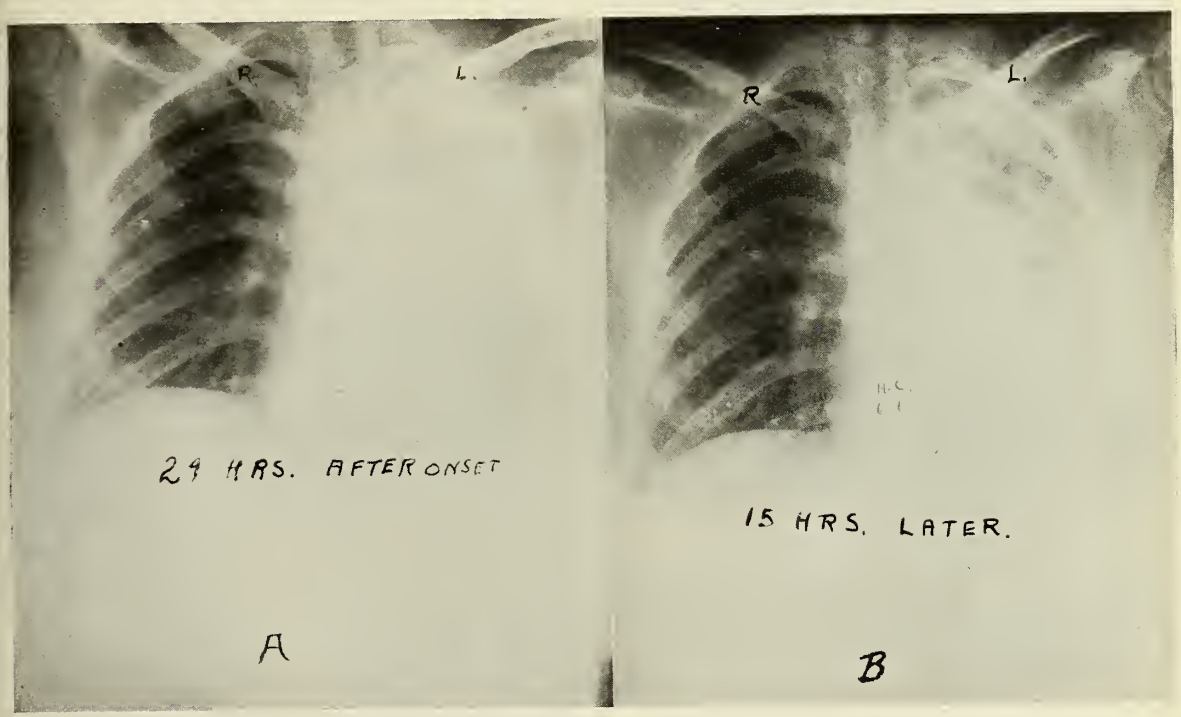


Fig. 2, Case 2.

A. Roentgenogram taken twenty-four hours after onset showing the marked opacity of the left lung and the displacement of the heart to the left.
B. Appearance fifteen hours later. Note the marked clearing that has taken place and the displaced heart.

The cases divide themselves into four groups. The first is composed of three cases which are typical of simple post-operative massive collapse without complications and illustrate the clinical and roentgenographic signs which have been previously described.

Case 1. E. L., a white male, eighteen years of age, was operated under ether anesthesia and an acute suppurative

appendix was removed. The post-operative course was normal until forty-eight hours, when the temperature rose to 102° F. Twelve hours later there was dyspnea, cyanosis, and slight cough. The clinical diagnosis was post-operative pneumonia. Two days later the physical signs suggested



Fig. 3, Case 4.

Roentgenogram taken two days after onset showing the marked opacity of the whole right lung and the displacement of the heart to the right. The left border is just visible beyond the spine and is indicated by the arrow.

effusion on the right side. Paracentesis was done repeatedly without result. The first roentgenogram was made four days after the onset and showed almost complete opacity of the whole right hemithorax. The heart and trachea were markedly displaced to the right and the right diaphragm could be just made out at the fourth rib anterior. The symptoms and signs continued for eight days, when improvement began. The temperature was never above 102.6° F. and cyanosis was marked throughout. Bronchial râles only could be heard; there was marked dullness with suppression of breathing. The patient was not toxic and not even uncomfortable. The second roentgenogram (Fig. 1 A), taken on the seventh day after the onset, shows clearly the marked displacement of the mediastinum toward the right side, the high right diaphragm, and the mottling of the lung field which was still present. The patient recovered completely and was discharged two weeks later. Fig. 1 B shows the appearance before discharge, the lung fields, mediastinum, and diaphragms being entirely normal.

Case 2. This followed cholecystectomy under local anesthesia. The onset occurred in sixty hours, cyanosis was prominent, there was marked immobility of the left chest, the temperature did not go above 103° F., and the symptoms only lasted four days. The clinical diagnosis was post-operative pneumonia. The first roentgenogram (Fig. 2 A) was taken 24 hours after the onset and the diagnosis was made at this time. The marked opacity of the entire left lung and the displacement of the mediastinum to the left is well shown. A second film (Fig. 2 B) was made fifteen hours later and demonstrates the extremely rapid clearing of the lung and the displacement of the heart, which was still present.

Case 3. This was in a child of ten years and followed appendectomy. The clinical course was somewhat prolonged but otherwise the clinical and roentgenographic signs were the same as those described above. There was also complete recovery.

These three cases illustrate well the salient facts in uncomplicated, unilateral, post-operative massive collapse. In one case there was local anesthe-

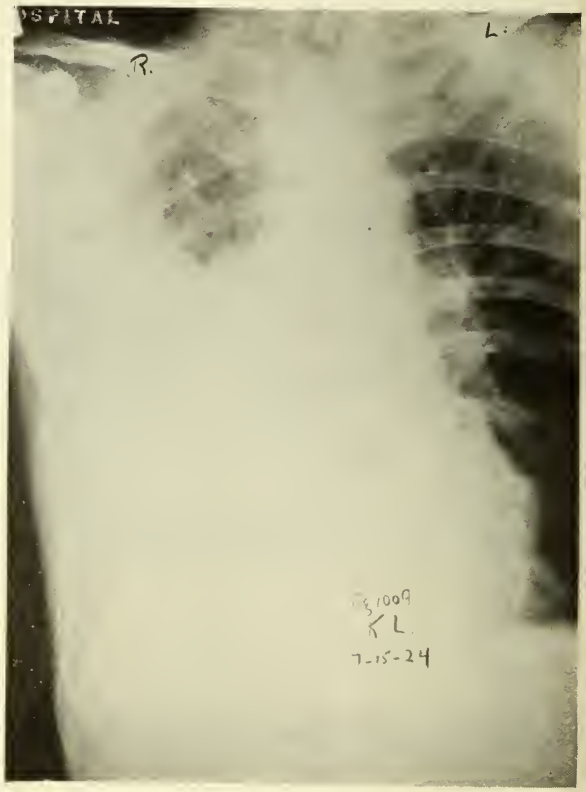


Fig. 4, Case 6.

Roentgenogram taken twenty-four hours after onset showing the marked opacity in the lower right lung and the displacement of the heart to the right.

sia used and all were abdominal operations. The onset was sudden, the symptoms mild, the physical signs indicated fluid, cyanosis was prominent, the temperature was low, toxicity was not marked, the course was fairly short and mild. The typical *x*-ray findings of opacity and displacement of the mediastinum toward the side of the lesion were

present in all three cases. The rapid clearing of the lung in Case 2 was notable.

The second group consists of two cases illustrating complications in post-operative massive collapse.

Case 4. V. S., a white female, had a bilateral salpingectomy under ether anesthesia. One day later the temperature rose to 100.2° F. and a cough developed. The next day the respiratory symptoms became more pronounced, the temperature rose higher, and marked cyanosis developed. There were signs of consolidation throughout the right lung. Figure 3 indicates the roentgen appearance at that time; the whole right lung was opaque, the mediastinum displaced markedly to that side. The temperature later rose, reaching 104.2° F., and leucocyte count became 15,500. The symptoms continued until eleven days after operation, when a crisis took place, following which the roentgenogram showed resolution with retraction of the heart still present. There was improvement for two days; the lung appeared to clear; the next film showed the heart in normal position. Symptoms and signs of empyema then appeared and were confirmed by *x*-ray examination, which now showed the heart displaced to the left. Thoracotomy

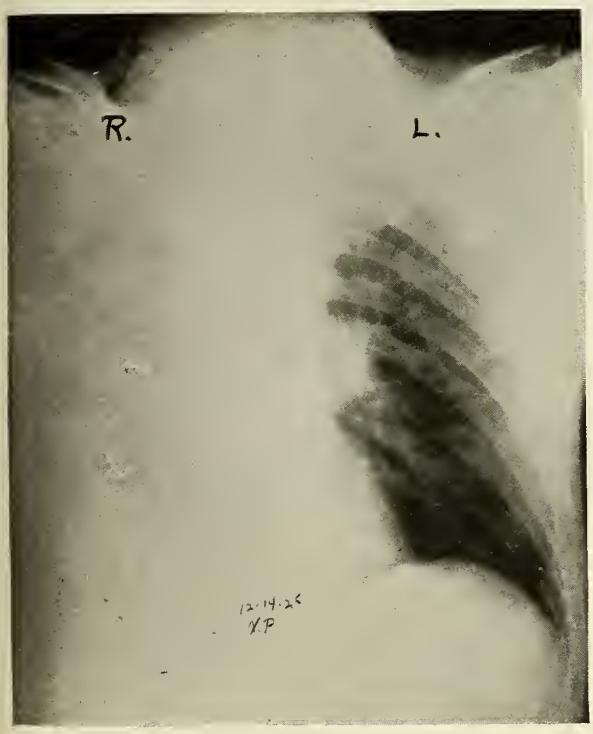


Fig. 5, Case 8.

Roentgenogram taken twenty-four hours after onset. Note the partial opacity of the whole right lung, the upward displacement of the diaphragm and the displacement of the heart to the right.

was performed, pus obtained, but there was no relief and the patient died.

The mildness of onset, the marked displacement of the mediastinum toward the side of the lesion, the marked cyanosis, and low temperature indicate a massive collapse at the beginning. The onset of toxicity and high temperature, the typical crisis at the end, and the appearance of empyema later, all indicate a superimposed pneumonia. The mobility of the mediastinum and its response to changes in intrathoracic pressure was well shown by the movement from extreme right displacement to extreme left displacement as the collapse disappeared and pleural effusion appeared.

Case 5. This also followed bilateral salpingectomy. The onset and clinical course were typical of massive collapse until the third day after the onset, when rusty sputum appeared and distinct signs of consolidation of the right upper lobe were found. *X*-ray examination the next day showed a typical right upper lobar pneumonia. In addition, there was some mottling of the middle and lower lobes, a very high right diaphragm, and marked displacement of the mediastinum to the right.

The rusty sputum, physical and *x*-ray findings indicate that pneumonia appeared superimposed upon an ordinary case of collapse.

The third group comprises three cases illustrating post-traumatic massive collapse. These are usually diagnosed pneumonia, although the rapid appearance of the symptoms after the accident has been a puzzling factor. They resemble closely the bullet wound cases reported by Bradford and others. Very little attention has been paid to this group, although they are no doubt of considerable importance even in civil practice.

Case 6. K. L., a white male, was admitted twelve hours after sustaining a fracture of the pelvis. He had been perfectly well before this injury, but on admission he had a cough, expectoration, a temperature of 102° F., marked cyanosis, and dullness and absence of breathing over the right lung. Figure 4 represents the roentgenogram taken the next day. There is marked opacity of the whole right lung with definite displacement of the heart toward it. The temperature never rose above 102.6° F. and the leucocyte count was 9,900. In six days the temperature was normal and the patient began to expectorate large quantities of mucoid sputum. A roentgenogram before discharge showed the mediastinum in normal position.

Case 7. This also followed a fracture of the pelvis. The patient was admitted immediately and had no symptoms or signs of a pulmonary condition. The typical symptoms and signs appeared within twelve hours and lasted only three days. The roentgenographic signs were characteristic.

Case 8. From the Northern Pacific Hospital. This patient sustained a fracture of the spine and of the right ribs. On admission there were no respiratory signs or symptoms. These developed as in the above cases. Owing to the known rib fracture and the physical signs it was thought that there was a hemothorax. The roentgenographic findings (Fig. 5) were typical of massive collapse, however, and the pulmonary condition disappeared in a short time without interference. This case was diagnosed roentgenologically by Dr. Walter H. Ude.

All these cases had a sudden onset of respiratory symptoms and signs shortly after severe injury.

These were accompanied by low temperature and the cases ran a typical, mild, short course. The roentgenograms demonstrate the displacement of the mediastinum toward the side of the lesion, indicating the presence of massive collapse of the lung. The last case resembles very closely the war wound cases of Bradford, in which hemothorax was also thought to be present because the trauma was to the chest wall.

The final case illustrates a group in which alternate collapse and clearing occurs and the symptoms and signs persist for a long period of time with eventual recovery.

tachypnea, tachycardia, cyanosis, aphonia, and a temperature of 99.2° F. The *x*-ray film at this time showed a diffuse, mottled, dense shadow throughout the left lung with displacement of the mediastinum to the left. A week later (Fig. 6 B) the whole left lung was markedly opaque and there was such marked displacement of the heart and trachea to the left that a clinical diagnosis of pneumothorax on the right side was considered. The temperature was never above 101° F. A week later there was some clearing again and about this time the patient began to bring up copious quantities of thick mucoid sputum. Recovery followed this rapidly. He was finally discharged as recovered three months after the onset. The last roentgenogram showed the lung clear and the mediastinum in normal position.

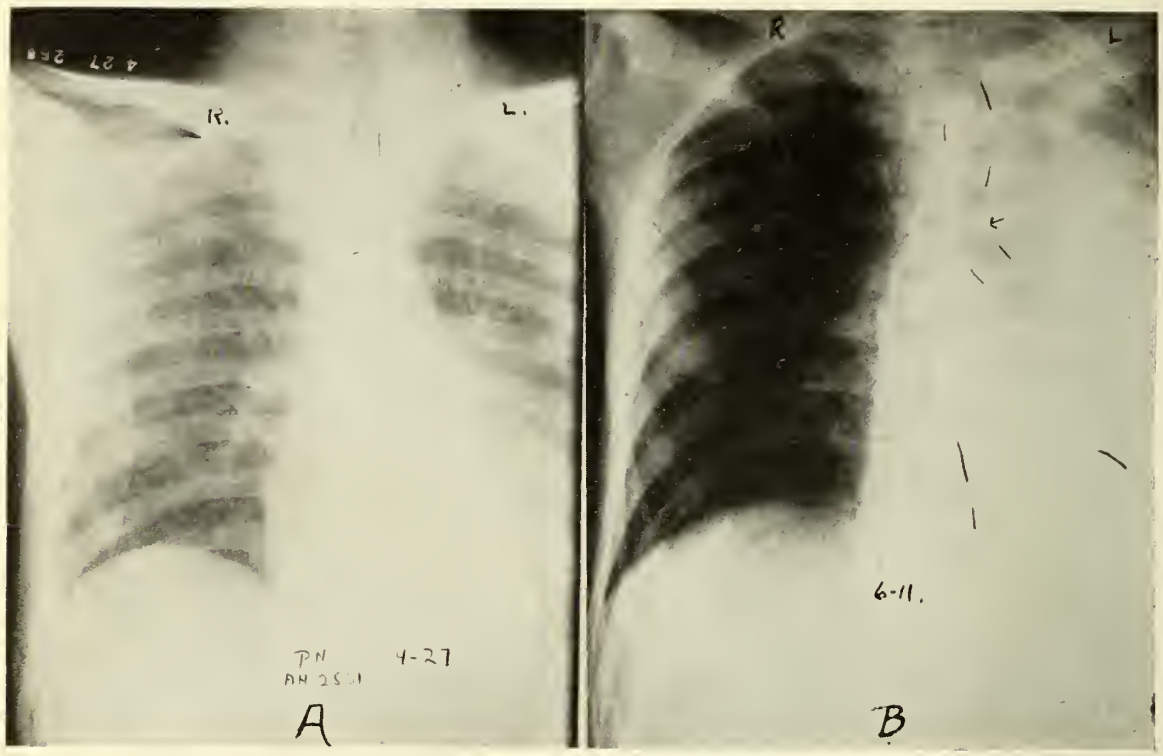


Fig. 6, Case 9.

A. Roentgenogram taken shortly after the onset of symptoms. Note the shadow in the left lower lobe and the normal position of the mediastinum.

B. The appearance six weeks later. Note the marked opacity of the whole left side, the extreme displacement of the heart and trachea to the left, the high diaphragm. The right border of the heart is indicated by lines, the diaphragm and trachea by arrows.

Eventually the appearance of this chest became entirely normal.

Case 9. P. N., a white male, was admitted suffering from a bullet wound in the abdomen. The bullet was removed and five days later he developed severe respiratory symptoms. The *x*-ray examination at that time (Fig. 6 A) revealed the heart in normal position, but there was a shadow in the left lower lobe thought to be pneumonia. A week later the patient had apparently recovered, but the roentgenogram at that time showed displacement of the mediastinum to the left with some mottling of the lung. He left the hospital at this time and was not well for about a month, when he returned showing extreme dyspnea,

The long duration, the alternate collapse and clearing of the lung, and the extreme displacement of the heart and trachea to the left, were the interesting features in this case. The aphonia was thought to be associated with the extreme deviation of the mediastinum, possibly from pressure, as it disappeared when the patient recovered from the pulmonary condition.

Thanks are due to Dr. Walter H. Ude for assis-

tance in the study of these cases and for the privilege of reporting Case 8.

SUMMARY

1. Massive collapse of the lung is a clinical and pathological entity, identical with pulmonary atelectasis, and frequently follows trauma below the neck.

2. The symptoms and signs resemble pneumonia except that the course is more mild, there is less toxicity, and cyanosis is more prominent. The most important finding is the displacement of the mediastinum toward the side of the lesion and the upward movement of the diaphragm on the same side.

3. The roentgenogram affords the best method of diagnosis. There is marked opacity or mottling of the affected lung. The high diaphragm and displaced mediastinum can best be made out in this way.

4. Nine cases are reported which divide themselves into four groups as follows:

(1) Uncomplicated, unilateral, post-operative massive collapse following cholecystectomy under local anesthesia in one case, and appendectomy in two cases. These present the typical symptoms, physical signs, and roentgenologic findings.

(2) Two cases of post-operative massive collapse complicated by pneumonia, in one of which empyema also developed.

(3) Three cases of post-traumatic massive collapse, two following fractures of the pelvis, and one following fracture of the spine and ribs. These cases are probably more frequent in civil practice than has been believed.

(4) One case of alternate collapse and clearing extending over a long period of time with eventual recovery. This was also post-traumatic.

BIBLIOGRAPHY

1. Pasteur, W.: Lancet, 1908, 2, 1351; Brit. Jour. Surg., 1914, 1, 587.
2. Barr: Brit. Med. Jour., 1907, 2, 1289.
3. Elliott and Dingley: Lancet, 1914, 1, 1305.
4. Bradford: Oxford Loose Leaf Medicine, 2, 127.
5. Scrimger: Surg., Gyn. and Obst., 1921, 32, 486.
6. Hirschboeck: Am. Jour. Med. Sci., 1922, 164, 268; Minn. Med., 1924, 7, 414.
7. Scott: Arch. Surg., 1925, 10, 73.
8. Jackson and Lee: Ann. Surg., 1925, 82, 364.
9. Churchill: Arch. Surg., 1925, 11, 489.
10. Holmes: Am. Jour. Roentgenol., 1924, 10, 509.

REST IN THE TREATMENT OF PULMONARY TUBERCULOSIS*

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In the treatment of tuberculosis, especially the pulmonary lesions, we obtain our results very slowly. Yet good results can be obtained in a large percentage of reasonably early cases if physician and patient will take the necessary time. At the beginning of treatment it is also very important to recognize the fact that an individual once afflicted with an open active pulmonary tuberculosis must live a restricted life for years after all symptoms of activity have disappeared, if relapses are to be avoided. However, the purpose of this paper is mainly to point out the safest road for the patient who is combating an active tuberculosis.

Of all the remedies that have been current in the treatment of this disease, rest is the only one that has been applicable in all active cases, and today it is recognized by experienced phthisiologists as the sheet anchor in treatment. Climate, forced-feeding, pine trees, etc., have had their day, but in the absence of physiologic rest they have been found hopelessly inadquate. Every year we hear of a new specific for tuberculosis, and after a few months these are found useless or only helpful in a limited number of the most favorable types of cases. Drugs are useful and often necessary in treating certain symptoms, but they certainly have no effect in checking or limiting the disease. In our opinion there are two essential adjuncts to a successful rest cure: fresh air and good, wholesome food.

Strange as it may seem, rest in the treatment of this disease has been seriously tried only during the past decade. We believe that we are getting better and more permanent results by giving patients a long period of rest when they first come under observation. Since the advent and general use of serial roentgenography by Amberson and others, in following the course of tuberculous individuals under treatment, we have found that many serious lesions clear up entirely or are greatly diminished in size by a few months of rest in bed. The cases that show complete or almost complete resolution are generally the more acute ones whose onsets

*Read before the Ramsey County Medical Society, St. Paul, 1926.



Fig. 1a. W. Z., Aug. 23, 1923. Showing infiltration in left upper lobe, slight fibrosis of the right apex.



Fig. 1b. W. Z., Sept. 3, 1924. Showing marked clearing in left upper lobe with evidence of thickened pleura and a small amount of fluid in left lower.

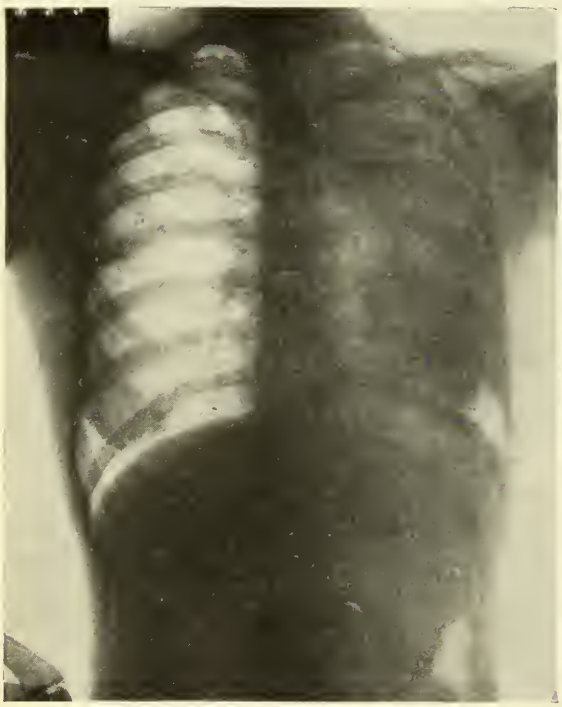


Fig. 2a. Miss E. R., Sept. 9, 1923. Showing extensive infiltration of the left lung, with a very good right lung.

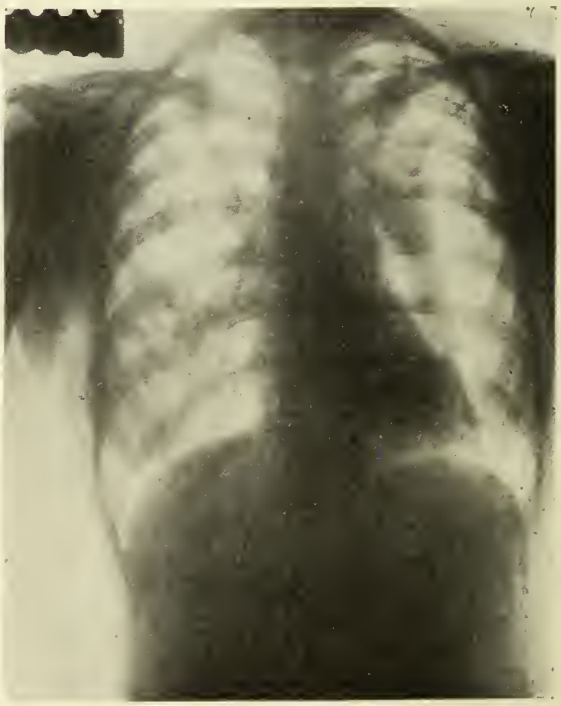


Fig. 2b. Miss E. R., July 14, 1924. Showing extension of disease to the right lung, left lung half compressed with an adhesion preventing a complete collapse of the upper lobe.

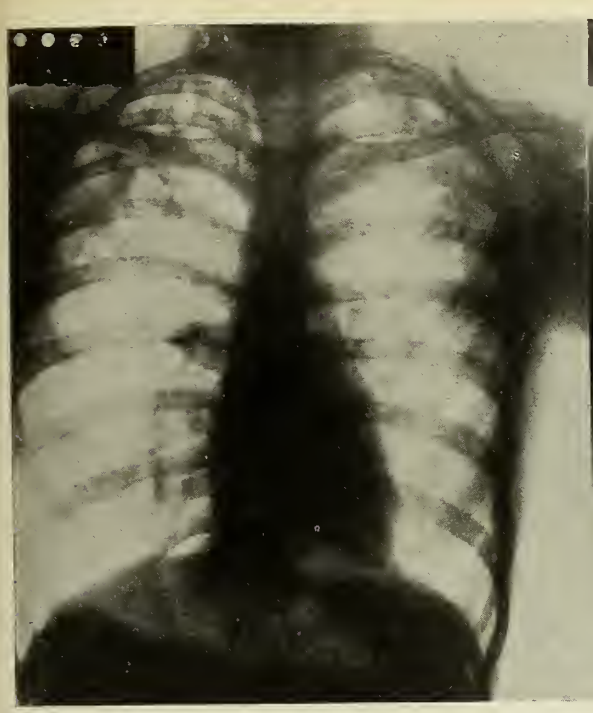


Fig. 3a. Miss F. A., July 22, 1922. Evidence of involvement in both upper lobes.

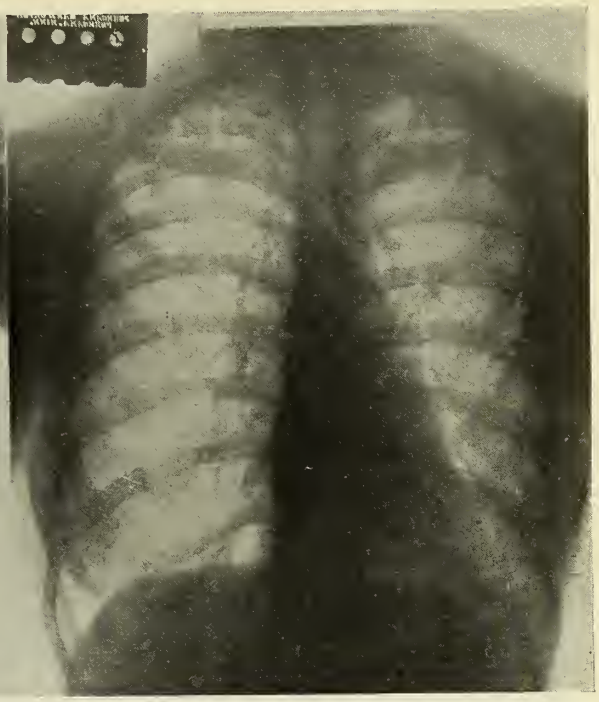


Fig. 3b. Miss F. A., April 10, 1924. After a large left-sided pleural effusion, which was not aspirated. Both upper lobes show remarkable clearing. There is an obliteration of the left costo-phrenic angle.

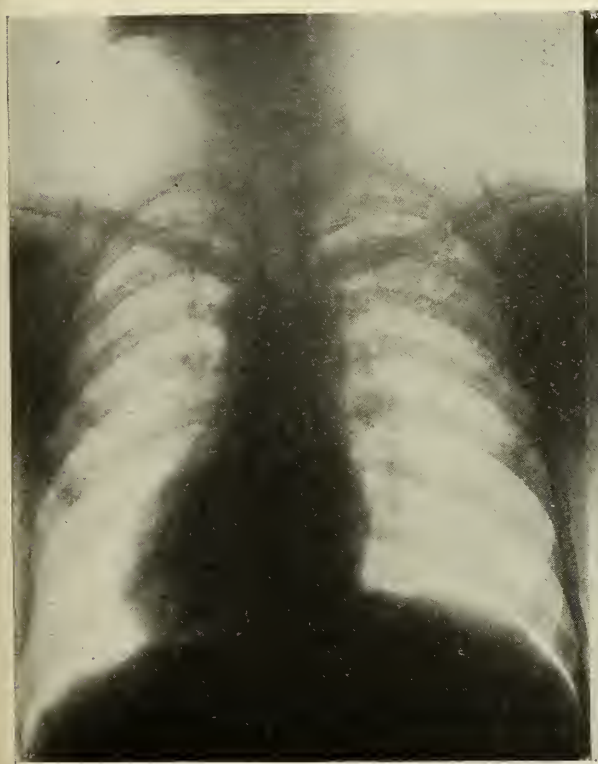


Fig. 4a. Mr. P. D., April 5, 1923. Showing extensive infiltration in both upper lobes.

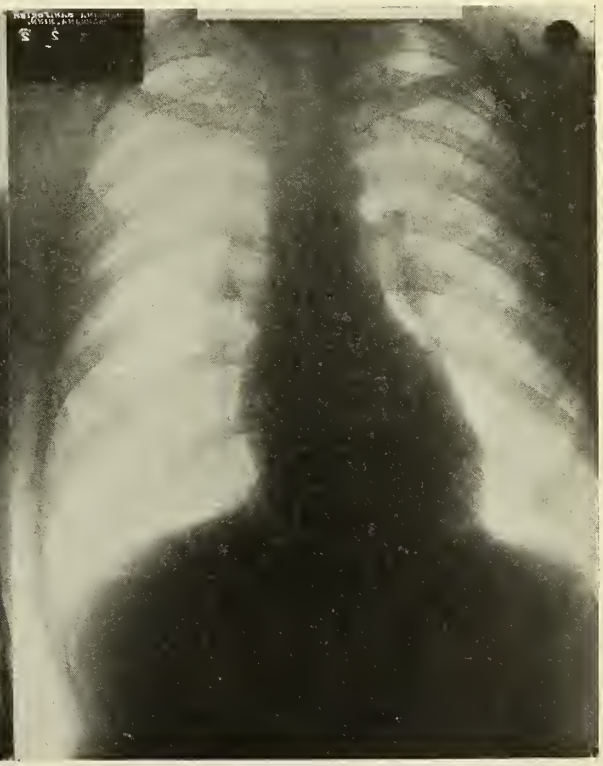


Fig. 4b. Mr. P. D., July 5, 1924. Showing almost a complete resolution in the upper lobes of both lungs.

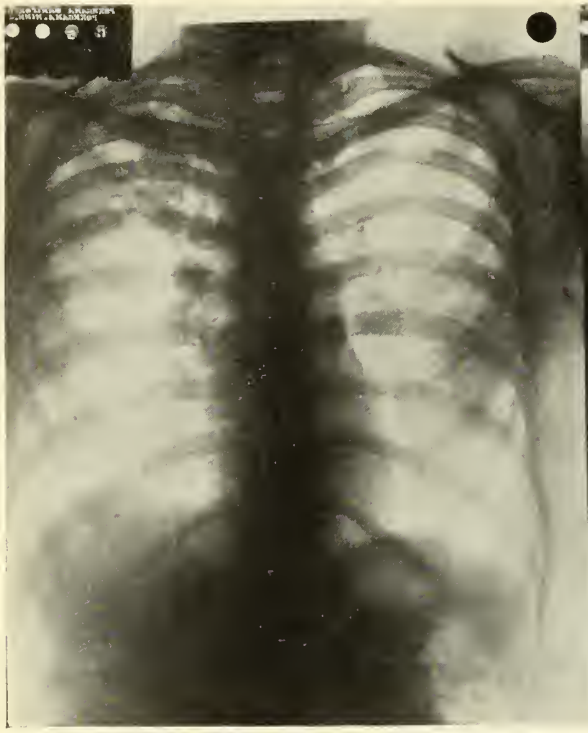


Fig. 5a. Mr. S. H., Sept. 21, 1922. Showing dense infiltration in the right upper lobe, with extensive infiltration in the middle of the left lung.



Fig. 5b. Mr. S. H., Aug. 25, 1924. After the absorption of a large left-side pleural effusion. Shows a disappearance of a left-sided lesion and a fibrosis of the right apex.

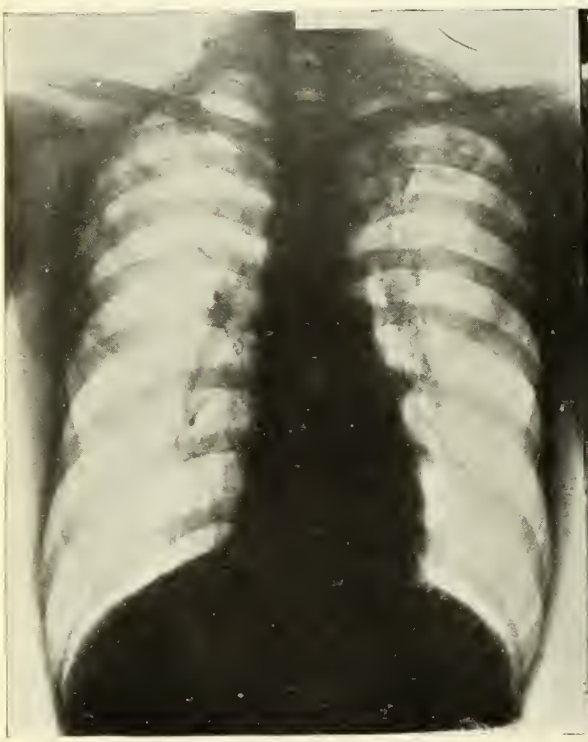


Fig. 6a. R. K., July 17, 1922. Showing infiltration and fibrosis in both upper lobes, with a probable cavity in the left upper.



Fig. 6b. R. K., June 27, 1923. Shows clearing in both upper lobes, with evidence of marked fibrosis in the left upper.

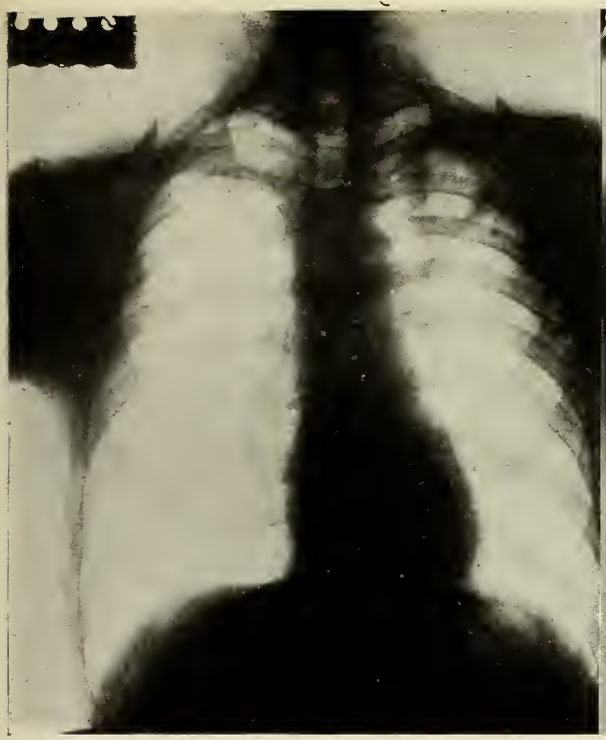


Fig. 7a. A. F., Nov. 12, 1925. Showing rather marked involvement in the left upper lobe, with probable cavity formation. History of two years' standing.

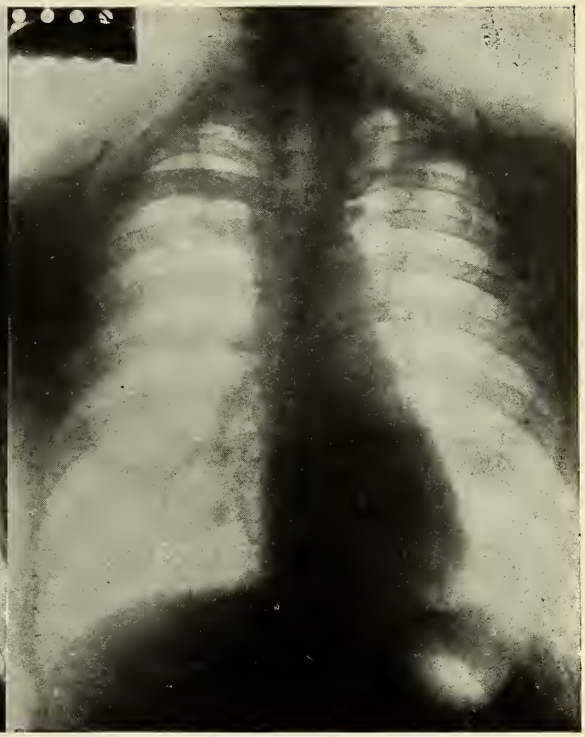


Fig. 7b. Feb. 5, 1926. After 12 weeks' rest in bed, there is a complete disappearance of the annular shadow or cavity in the first picture, and the lesion is very much smaller.

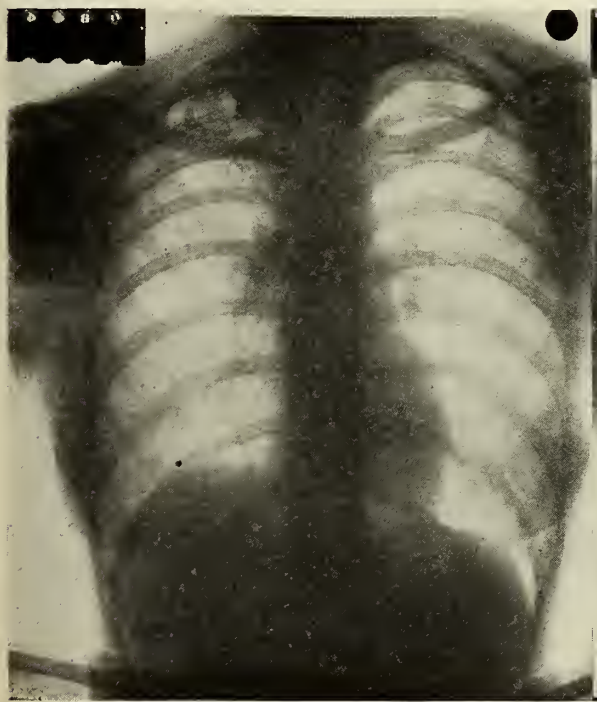


Fig. 8a. Mrs. R. Mc., April 17, 1925. Showing infiltration in right upper lobe with cavity formation.

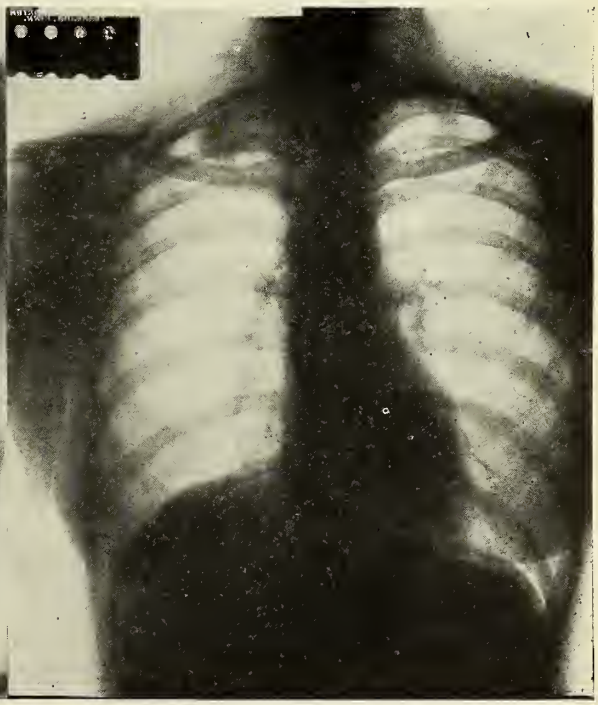


Fig. 8b. Mrs. R. Mc., Nov. 20, 1925. Showing marked density in the right apex, disappearance of the cavity.

are frequently mistaken for atypical pneumonia. The pathological changes found in these cases consist indubitably of few characteristic tubercles but considerable inflammatory reaction in the adjacent pulmonary tissue—in other words, the exudative type of tuberculosis. When the resistance of the host is good, the tendency is toward resolution; when poor, caseation and cavity formation rapidly follow.

The common run of adult tuberculosis, the proliferative type, in which there is healing and progression of the lesion at the same time, shows lessening in the extent of the lesion under the rest cure, but there is almost always a rather extensive residue of fibrous tissue and calcium deposits left at the site of the involved area.

At the beginning of treatment we must give our patient as much information in regard to his problem as we possibly can. Without his co-operation we are usually defeated before we start. It is not easy for patients to give up all physical activity when to outward appearances they are well and have only a little cough and sputum in the morning, and an occasional elevation in their evening temperature. As a general rule patients can be convinced of the importance of getting their disease well under control before starting exercise. The occurrence of a sharp attack of pleurisy or a pulmonary hemorrhage early in the disease usually puts patients in a favorable frame of mind for accepting a sentence of prolonged rest in bed. In institutions, patients who have not had these symptoms themselves often profit by the experience of others.

Rest as a therapeutic measure may be considered as of two kinds: local and general. Neither of these can be efficacious in itself; they must be applied simultaneously and over a period of time if the best results are to be obtained.

We define local rest for our purpose as a functional restriction of the diseased tissues. In connection with this consideration an interesting paradox has been emphasized by Krause. The area of the lungs where normal respiratory movement is least, the apices, seem most prone to active disease, but once established there it tends with fair frequency toward arrest and control. The more movable portions of the lungs show far fewer primary lesions, but once they occur there the process is more prone to rapid dissemination.

Many patients when they first come under treatment have an idea that deep breathing exercises are extremely desirable. They also believe that they should cough at any and all times in order to loosen and expel the "phlegm" collected in their lungs. To anyone familiar with the pathology of tuberculosis it is easy to see how these procedures aid the tubercle bacillus. Except in cases of laryngeal involvement the cough is rather easily controlled by the exercise of a little will power and cessation of physical exertion.

Gilbert and Webb advise their patients to lie on the side of the more diseased lung in order to diminish its expansion. Having tried this in a limited number of cases we found that it caused increased coughing and not a little general discomfort, and decided to have our patients lie in the position in which they were most comfortable.

Adolphus Knopf has his patients cut down the number of respirations. He claims that the average patient can reduce his respirations to six per minute and thereby save the diseased lungs a great deal of work. We believe that cutting down the number will necessarily increase the depth of each respiration. As the disease is usually in the upper lobes, which expand very little in quiet inspiration but do expand with deep inspiration, it seems to us that this method of respiratory control is of doubtful value. Strapping the chest with adhesive tape is valuable in acute pleurisy but probably has little effect in the treatment of parenchymal lesions. Bray has recently shown that when the chest is tightly strapped the lateral expansion of the lung is diminished, but the diaphragmatic excursion on the strapped side is greatly increased.

In unilateral lesions which cannot be controlled by the usual measures we have two methods of procedure of prime importance: artificial pneumothorax and thoracoplasty. The first is applicable in cases with a relatively free pleura; the second does its work well whether the pleura is free or adherent. We prefer pneumothorax when it can be done successfully, because we can discontinue it in case serious disease develops in the good lung, while a lung compressed by thoracoplasty is functionally incapacitated permanently. A mistake that is frequently made is in trying to collapse large upper lobe cavities that are wholly or partially adherent by pneumothorax. The lower lobe, which is often nearly free from disease, is nicely compressed, but the really dangerous lesion is little affected. It is also true that we occasionally rupture a cavity into

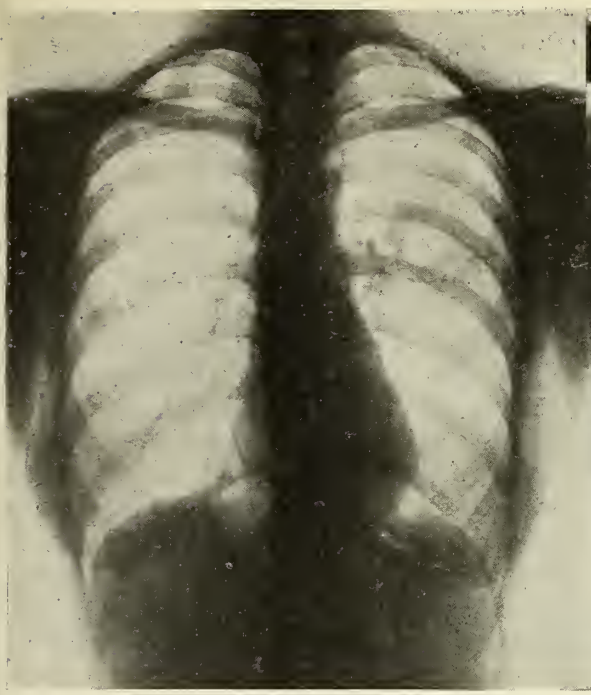


Fig. 9a. Miss E. H., April 22, 1925. Showing a moderate area of infiltration in the middle of the left lung.

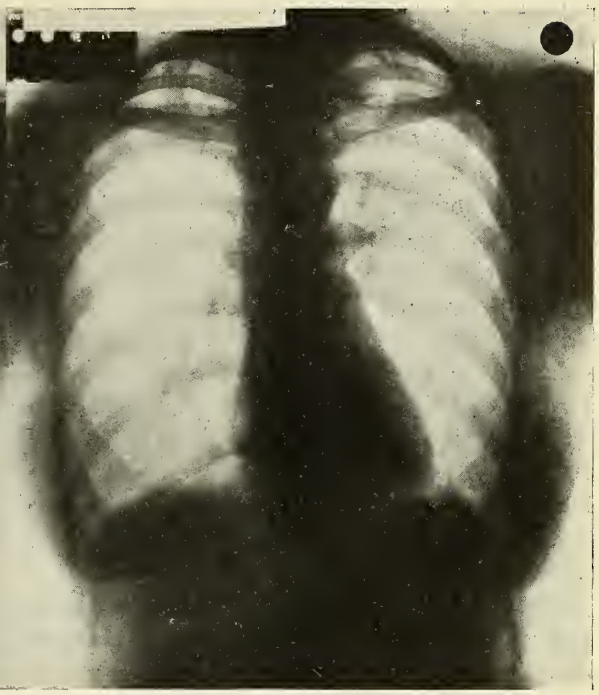


Fig. 9b. Miss E. H., Nov. 16, 1925. Showing obliteration of the costo-phrenic angle on the left side, a slight increase in the hilum shadow, and almost complete resolution of the parenchymal lesion noted in films made six and one-half months before.

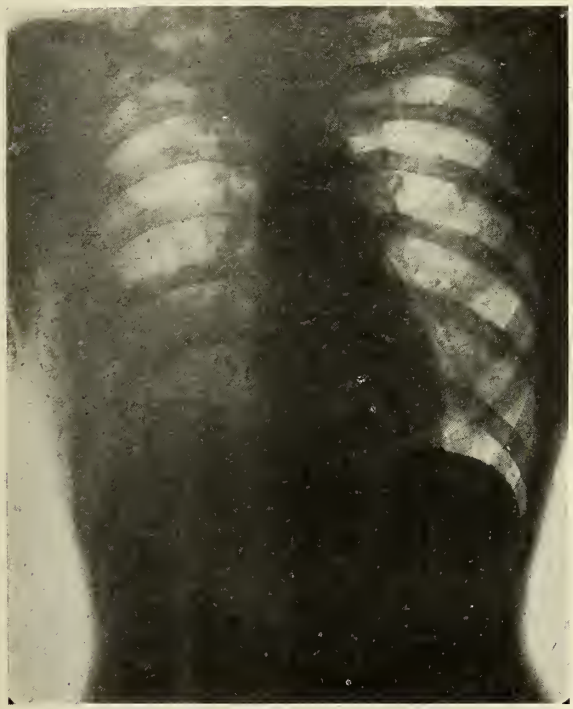


Fig. 10a. Mrs. J. R., June 24, 1925. Shows evidence of marked infiltration in the right upper lobe, with thickened pleura under the right base, with slight infiltration at the left apex.

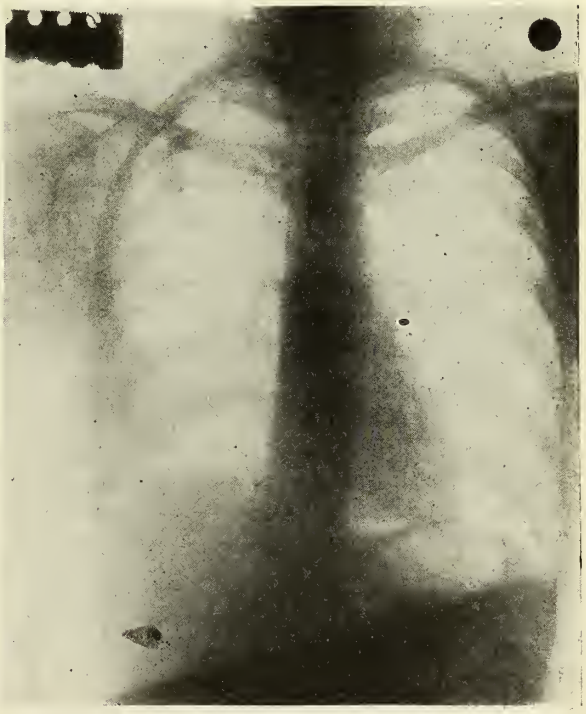


Fig. 10b. Mrs. J. R., Dec. 12, 1925. Shows marked evidence of healing at both apices, and density at the right base.

the pleura by breaking some of the adhesions when the cavity is located near the pleural surface. This is likely to cause a tuberculous pyo-pneumothorax which is a very disagreeable complication. In this type of case the discontinuance of inflation and the institution of thoracoplasty early would give us vastly better results. The success of these methods depends largely upon the proper selection of cases. Their value in closing large cavities, which are always a menace, and in controlling severe pulmonary hemorrhage can hardly be overemphasized. It is also important to remember that pneumothorax and thoracoplasty cases require, if anything, a longer period of bed rest than the general run of patients. We must bear in mind that the patient is combating a serious infection; that one lung is practically put out of use, and that we have partially rearranged the organs of the thorax.

By general rest we mean the absolute avoidance of any bodily fatigue. This can only be obtained by rest in bed in hygienic surroundings. In this way we obtain two objects. In the first place respiratory exertion is reduced to a minimum, and, secondly, we reduce the body metabolism, and conserve the patient's energy to aid him in combating his infection. The length of time patients should be kept in bed depends on the extent of lung involvement, severity of symptoms and their general condition. When the health of the patient has not been seriously undermined we often see the pulse and temperature become normal; night sweats, gastrointestinal symptoms and even the cough and expectoration disappear in a few weeks. As a general rule in the ulcerative cases the sputum is the last thing to go. Some believe that all positive sputum cases should be kept at absolute rest until the sputum disappears entirely or becomes negative. No one will question the desirability of having all positive cases become negative, but it is often difficult of achievement. It is also true that we frequently see individuals who are symptom-free, except for a small quantity of sputum, lose their sputum and bacilli when their lung lesions are stimulated by a moderate amount of exercise or the judicious use of tuberculin, or both.

In recent years it has been our custom to keep patients in bed for a month after their temperature curve has been normal and all symptoms of toxemia have disappeared. The body weight should also be within a few pounds of their normal weight in health. However, in the presence of very extensive lung findings, previous history of severe hemorrhages or complications, the time of complete rest is doubled or trebled. The one disadvantage in this method of treatment that we have had to contend with is that a few patients lose confidence in themselves and do not want to begin exercise for fear of bringing about a relapse. Fortunately, the number of such cases is small, but when we do have them they are a real problem.

SUMMARY

1. Febrile cases of tuberculosis with progressive lesions require absolute bed rest as much as any other general infection that is likely to prove fatal.

2. The control of cough is one of the most important single factors in obtaining pulmonary rest.

3. Pneumothorax and thoracoplasty return to a productive life many tuberculous individuals who would otherwise fill an early grave.

4. We know of no other disease save diabetes in which the co-operation between physician and patient is more important than it is in the treatment of tuberculosis.

BENZYL BENZOATE FOR THERAPEUTIC USE

VanDyk & Co., Twenty Per Cent Aromatized Suspension Made From Benzyl Benzoate (VanDyk & Co.) and Benzyl Alcohol-VanDyk & Co. Omitted From N.N.R.—The Synthetic Drug Corporation (formerly the United Synthetic Chemical Corporation) markets a brand of benzyl benzoate—Benzyl Benzoate for Therapeutic Use (VanDyk & Co.)—and a preparation of it—Twenty Per Cent Aromatized Suspension of Benzyl Benzoate (VanDyk & Co.). The advertising for these was based on the enthusiastic reports that were published when benzyl benzoate was first used experimentally in mdicine. In consideration of the revised estimate of benzyl benzoate, the Council on Pharmacy and Chemistry urged the distributor of these preparations to revise the advertising claims. This revision was not made and, therefore, the preparations have been omitted from New and Non-official Remedies. Benzyl Alcohol-VanDyk & Co. was acecpted for New and Non-official Remedies as a brand of benzyl alcohol-N.N.R. Recently, the distributors — Synthetic Drug Corporation — have adopted the name, "Benzylol" for it and claim this name as a "word mark." The Council on Pharmacy and Chemistry omitted the product from New and Non-official Remedies because it is marketed under a name which the Council cannot recognize. (Jour. A. M. A., April 17, 1926, p. 1233.)

THE PRESENCE OF DIPHTHERIA BACILLI IN THE NASAL CAVITY OF THE NEWBORN*

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Several authors have maintained that it is not uncommon to find diphtheria bacilli in nasal swabs from newborn infants. The number of positive findings is given as from 2.5 to about 84 per cent.[5,8,10] The incidence of nasal diphtheria is relatively small, as is to be expected from the response of the newborn infant to the Schick test for immunity to diphtheria. From this it is evident that protection is afforded to about 85 per cent of the newborn. The percentage of unprotected infants is sufficiently large to make the prevalence of diphtheria bacilli a real menace. Occasional epidemics in hospital nurseries call forth various efforts to protect the newborn infants against diphtheria. Furthermore, Kirstein reports the occurrence of diphtheria when the immunity of the infant, as measured by the antitoxin content of the blood, should have sufficed for protection. The question has been raised by von Gröer as to whether these were really cases of diphtheria.

Because of the danger to the child and because of the communicable nature of the disease, further investigation seemed indicated. The infants born on the obstetric service of the Mayo Clinic and taken care of by the pediatric department furnished the opportunity for this study.

Cultures were taken from the nasal cavity of 421 newborn infants during a period of about two years. In 182 cases, cultures were taken only once; in 239, on two different days, and in sixteen instances several cultures were taken. The cultures were taken on Loeffler's blood-serum agar and examined by Magath. The classification was made according to Wesbrook, Wilson, and McDaniel. The presence of diphtheroid bacilli was reported in seventeen instances; in one instance a doubtful bacillus was reported; in another there was a bacillus which morphologically had to be classified as a diphtheria bacillus. When more than one culture was taken, the diphtheroid bacilli happened to be found at only one examination.

No efforts were made to determine the flora, but usually staphylococci were found, more rarely streptococci and other micro-organisms, and there was a small number of inoculations without growth. Occasionally, there was an infant with rhinitis or conjunctivitis. In the latter cases no micro-organisms were demonstrable either by smear or culture. Examination for inclusion bodies was not made.

DISCUSSION

In this series of 421 cases, diphtheria-like bacilli were found in nineteen instances, giving a percentage of about 4.5. Frequently cultures were taken only once. The number of positive findings might increase considerably on more frequent examination. For instance, in Kirstein's series, when cultures were taken daily, 84 per cent were positive. In single examinations positive findings were obtained in about 27 per cent. My examinations were made in an ordinary community. A mild diphtheria epidemic occurred during the period of the examinations, fortunately leaving untouched the obstetric service and nursery.

In 1918, Lietz examined 606 infants in an institution devoted to the teaching of midwifery, and positive findings were obtained in 2.5 per cent. The following year 691 infants were tested with positive findings in 4.2 per cent. In both series, the cultures were examined by a bacteriologist and the diphtheria bacilli identified on the basis of staining with the Neisser double stain, the Gram stain, and 1 per cent hot collargol solution. My figure of 4.5 per cent coincides closely with that in the second series of Lietz. In the one culture in which the bacillus grown could not be distinguished morphologically from a true diphtheria bacillus, it proved avirulent. In the other case some doubt existed as to whether the bacillus grown belonged to the diphtheria or pseudodiphtheria group; the virulence test was not made and repeated cultures were negative.

That the bacilli found in the nasal cavity of the newborn infant belong, in the most instances, to the avirulent group, has been asserted by some authors, particularly by Kritzler. With him and Schoedel, I share the opinion that the clinical significance of these findings may easily be overestimated. It is very difficult, if not impossible, to determine by morphologic or staining characteristics alone, whether a given bacillus belongs to the virulent or avirulent Klebs-Loeffler group or to

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the pseudodiphtheria group. Neither the classification of Lietz nor my classification can be regarded as fully established. However, the fact that the bacilli are frequently found at one examination only, that they are so often without clinical manifestation, and that a case of transmission due to one of these infants has not been convincingly shown, prevented me from extending my investigation further.

The frequent occurrence of diphtheria bacilli in the nasal cavity of the newborn is to be separated from the problem of diphtheria of the newborn.[1,2,3,7,9] It is certain that diphtheria of the newborn does occur, and it seems that the nasal cavity in the newborn infant is the seat of predilection. Since the clinical course may be very mild, such cases can easily be overlooked and regarded as rhinitis. They may be dangerous to the infant as well as to the community. A discussion of this problem is not pertinent to the present subject.

BIBLIOGRAPHY

1. Elter, R.: Diphtherie beim Neugeborenen. Inaugural Dissertation. Jena, 1919.
2. Esch, P.: Ueber zwei Endemien von primärer Nasendiphtherie bei Neugeborenen (mid einigen Bestimmungen über den Diphtherie-Antitoxingehalt im Blutserum). Ztschr. f. Geburtsh. u. Gynäk., 1918, lxxx, 551-575.
3. Göppert, Friedrich: Beiträge zur Kenntnis der Nasendiphtherie. Monatschr. f. Kinderh., 1923, xxv, 201-210.
4. Gröer, von: Ueber die Wirkung der Diphtherieantitoxins im Organismus des Neuengeborenen. Monatschr. f. Kinderh., 1923. xxiv, 635-640.
5. Kirstein, Friedrich: Ueber eine auffallende biologische Eigentümlichkeit des Neugeborenen. Deutsch. med. Wchnschr., 1921, ii, 1393-1395.
6. Kritzler, Hans: Beobachtungen über das Vorkommen von Diphtheriebazillen und Diphtheroiden Stäbchen beim Neugeborenen unter besonderer Berücksichtigung der klinischen Bedeutung dieses Befundes. Ztschr. f. Geburtsh. u. Gynäk., 1921, lxxxiv, 179-207.
7. Landé, Lotte: Die primäre Nasendiphtherie im Säuglings- und Kindesalter. Jahrb. f. Kinderh., 1917, lxxxvi, 1-42.
8. Lietz, F. H.: Ueber Diphtherie der Neugeborenen. Monatschr. f. Geburtsh. u. Gynäk., 1920, lii, 340-346.
9. Rominger, Erich: Ueber Diphtherie und Diphtherieschutz bei Neugeborenen. Ztschr. f. Kinderh., 1919, xxiii, 47-78.
10. Schoedel, Johannes. Diphtheriebazillen in der Nase des Neugeborenen und älteren Säuglings. Jahrb. f. Kinderh., 1921, xcvi, 273-278.
11. Wesbrook, F. F., Wilson, L. B., and McDaniel, O.: Varieties of Bacillus diphtheriæ. Tr. Assn. Am. Phys., 1900, xv, 198-223.

PRINCIPLES OF SUCCESSFUL CANCER SURGERY*

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The steady increase in the death rate from cancer, in spite of enormous funded research work and improved operative skill, has bred a condition of pessimism and apathy in the profession and of despair in the public. There is no reason for this other than the ignorance of the true nature of cancer.

To better our cancer results we must, as is universally admitted, see such patients earlier, for there is no cure for cancer that is worthy of the name that can successfully cope with advanced cancer. If cancer were not diagnosible and easily curable in the early stages we would have some excuse, but when the opposite is true, why stand we here idle? If half the time and energy were expended in teaching the busy practitioner, overwhelmed as he is with his multiform duties, the simple and easily recognizable indications of early cancer and pre-cancerous conditions, as is given to exploiting some special cancer treatment or draping the scenery with a few exceptionally brilliant, radical operations, we could get at the root of cancer sooner. The physician should know early cancer and what leads to cancer, and teach his patients these elementary truths. This is the first fundamental of successful cancer surgery.

We must realize and keep constantly in mind the practical fact that cancer is primarily a local disease that tends to become, and sooner or later does become, essentially a systemic affection unless blocked by surgery; that, preceding the initial local manifestation of cancer, there exists at the site of cancer development, for a greater or lesser length of time, a lesion or point of so-called chronic irritation that can be correctly called pre-cancerous. Chronic irritation in a carcinogenetic sense is a vague term and absolutely devoid of significance. Some kinds of chronic or local physical disturbance will produce cancer and many kinds will not.

Cancer starts at some vantage point, the sites of which are well-defined and are most accessible to chronic irritation and infection. I have in mind more particularly the malignancies of the epithelial

*Read before the Northern Minnesota Medical Society at Brainerd, Minnesota, Aug. 19, 1925.

type. From the original focus it spreads centrifugally along the lymphatics in all directions, with the lymph stream as well as against it, but more readily with it. There is very little current in the lymph stream. The cancer cells follow along the lymphatics until a lymph node is encountered. Here the cells are retarded for a greater or lesser length of time, depending upon unknown factors. Unquestionably the lymph glands are lines of defense that stay the progress. They are usually overwhelmed and the cancer breaks through their capsule invading surrounding tissues, or proceeds on through efferent lymphatics to affect other glands. It is possible, and, I believe, occurs oftener than we think, for these glands to overcome the cancer invasion. For practical purposes the blood stream can be ignored as a factor in the dissemination of cancer.

Cancer is what it is by virtue of its existence in, or encroachment on, vital organs or to metastases. When toxemia exists or accompanies malignancy it is due to secondary infection. Cancer has no demonstrable systemic toxic factor of its own.

In the absence of pyogenic infection, intrinsic cancer of the breast never kills, but, owing to the limited lymph node defense, it early disseminates far and wide to vital organs. Cancer of the bowel disseminates slowly owing to early block by lymph nodes. Cancer of the uterine cervix soon reaches the adjacent lymph glands, does not metastasize widely and kills by ureteral obstruction, secondary septic infection or peritoneal involvement; cancer of the tongue by secondary infection, starvation or maybe suffocation.

No one procedure is applicable to every cancer, phase, or stage of cancer. There are a few fundamental principles, however, we must observe. The growth should be removed completely with the least possible chance of favoring dissemination. The idea is to kill the intruder on the spot. Don't touch it until it is dead or thoroughly quarantined. In cancer surgery conservation of tissue or cosmetic effects are not to be primarily considered. Only those agencies definitely known to be effective should be considered in the surgery of cancer. They may be classed as mechanical, chemical or thermal. *X*-ray and radium cannot be classed as dependable cancer removers. Their effects are too uncertain and their modus operandi too much in dispute.

Among the agencies usually employed are the cutting, open or bloody operations. They necessitate considerable mechanical manipulation such as cutting, clamping, sponging, tying, dissecting with consequent bleeding and opening raw surfaces, proceedings all favoring cancer dissemination. The cold-steel, cutting operation has been carried out by the best surgeons under the best possible conditions and yet the cancer death-rate continues to climb. Either cancer is terribly on the increase, or we have been living in a fool's paradise. Of course, we probably get most of our cases too late, but at that we should have something to show for radical operating and complete operations. I look in vain for consolation. The cutting, radical or complete operation has gone about as far as skill and anatomical possibilities will allow.

After all, what can we mean by a complete operation? Do we mean that the last vestige of cancer is removed? This is hardly possible except in the very early cases. We can only mean that we have removed a handicap, the central focus of infection, and Nature does the rest. Perhaps we have been attacking Nature's defenses too ruthlessly, and following the pathologist too diligently. There is the idea all too prevalent that Nature is powerless against cancer; that if a cancer nest remains a recurrence is the inevitable result. Later teaching proves this to be a fallacy and acute clinical observations bear it out.

During a trip abroad two years ago, I sojourned in London considerable of the time and had occasion to hear the expression of more than one British surgeon regarding the paucity of results in operating cancer. Notably among these was Herbert J. Paterson. I had the opportunity of attending the annual meeting of the British Medical Association at Portsmouth. At that meeting before the Surgical Section Mr. Paterson read a paper entitled: "Are the Results of the Operative Treatment of Cancer Better Than Twenty Years Ago?" He concluded that they were not, and during the rather lively discussion that followed, I did not hear any speaker radically disagree. One or two intimated that they thought he should not talk so plainly. Most of the discussors emphasized early diagnosis. Among these was Charles P. Childe, then President of the British Medical Association. Mr. Childe occupies a position in Great Britain on the cancer question similar to that of Bloodgood in this country.

I quote a few sentences from Mr. Paterson's paper. He says, "I imagine that there are few of us who do not feel depressed at the poverty of our success when we reflect how small is the number of cases in which complete freedom from recurrence follows operation for cancer." He calls attention to the extent that primary mortality has been reduced, but he goes on to say: "From the point of view of remote results have we similar cause for satisfaction? Most of us have had isolated cases of freedom from recurrence for ten or even twenty years, but on the whole the proportion of those free from recurrence after five years appears to be about the same as it was twenty-five years ago. When I was house-surgeon I traced the results of the operation for mammary cancer performed by my chief, the late Mr. Alfred Willett. I found that 42 per cent of the patients were free from recurrence after three years, and 33 per cent after five years. In 1902, Mr. Thomas Bryant published a series of cases showing 50 per cent free from recurrence after five years and 32 per cent alive and well after ten years. It is not without significance that both these surgeons practiced what today would be considered a very inadequate operation. The axilla was not cleared out as a routine measure, but only when there was evidence that the glands were grossly diseased. It is interesting to compare these figures with those of Halstead, and the results of the more radical operation by his name. In spite of a more extensive operation his results appear no better than those I have quoted. He reported 46 per cent of the patients dead within three years, and 41 per cent alive and free from recurrence after three years. As regards cancer of the rectum, Mr. Harrison Cripps was able to report that 42 per cent of his cases were alive three years after operation, and most all of them were perineal excisions. Not many of us can show better results." In conclusion, Mr. Paterson remarks: "I need hardly add that nothing I have said is meant in the slightest degree to discourage operations for cancer, or to under-rate their necessity. My plea is for earlier and therefore less extensive operations and especially operations in two stages whenever practicable—that is, removal of the growth, and of the glands at a later period. Let us not be in a hurry to remove Nature's first line of defense."

So far as treatment is concerned, cancer may be classed as pre-cancer, initial cancer, progressed yet operable cancer and inoperable cancer calling for palliation only. A pre-cancer lesion is one which is very likely to develop into cancer. An initial cancer is dogmatically limited to the organ primarily involved. A progressed cancer has extended beyond the confines of the original site.

A cancer is early and operable as long as it can be reached and has not involved vital structures. By vital structures we mean those that cannot be mutilated or removed without too great a menace to life. The malignancy of cancer varies greatly, so that the time factor loses weight. It may have existed a long time and still be early, or it may be a late cancer so far as progress is concerned, although of comparatively short duration. Only clinical acumen will afford a wise decision.

Any lesion occurring in a person of cancer age, in a cancer site, preceded often by evidences of abnormal condition or local irritation that so closely resembles malignancy as to suggest the microscope, had better be treated as cancer first and submitted to the microscope afterward for classification. In other words, don't depend on the microscope for diagnosis or a line on treatment. History, the naked eye, appearance, and the sense of touch or feeling will do more than the microscope. McFarland, in his Surgical Pathology, says: "Cancer was never found by microscopic examination when it was not suspected from what the finger and naked eye had found, though occasionally what the eye and finger thought to be cancer was shown by the microscope to be something else." Diagnosis by realization, and not by confrontation, is only permissible in cancer.

It is frankly conceded that the manipulation of a cancer mass is reprehensible and liable to further dissemination. This has been demonstrated, experimentally, too. Cancer surgery requires at all times the utmost gentleness of manipulation.

Average surgeons, used to operating under general anesthesia, are, in my opinion, anything but gentle. They rarely make good technicians with local anesthesia. The technical training local anesthesia furnishes is a good adjunct to cancer surgery.

Mammectomy is a good criterion. Most surgeons are very particular to clean out the axilla first. After all palpable glands in the axilla are dug out the breast itself with the obnoxious lesion is released. Now, what is the reason for this ritual? Presumably to prevent the massaging or squeezing of cancer cells along the lymphatics towards the axillary glands. In other words, to minimize dis-

semination. But, does it do it? Cancer of the breast, *per se*, never kills. Then, wherein lies the danger of breast cancer? In the metastases. What metastases from mammary carcinoma kill? Those to the mediastinum, bones and liver. What route do cancer cells take to get to the liver and inside the chest? They travel through the chest wall directly under the breast or down the wall by way of the ligamentum teres to the liver. The dissemination is not so much by way of the axillary system, for here the lymphatics empty directly into the blood stream and we know cancer cells cannot live in the blood circulation. What, then, is the significance of affected axillary glands? This simply means that the cancer process has gotten beyond the confines of its original site, the breast. It means that if the axillary glands are reached the chances are that the intra-thoracic glands are also, or that the process is well on its way to the liver. Suppose, after breast removal, a continuance should later manifest itself in the axillary glands or in the neighborhood of the original operation. Remove them, of course. If grossly affected, I destroy the axillary glands after I remove the breast by a diathermy needle. Why remove the breast first? Simply to disconnect the source of infection as soon as possible from its line of advance to vital organs. While we are working in the axilla the breast gets more or less manipulation, trivial, perhaps, but some. Then, why take a little more chance, since it can serve no useful purpose? It would be more sensible, it seems to me, to begin at the navel and dissect up than at the axilla and dissect down. Another thing about enlarged glands is the fact that there is a fair chance that they are not carcinomatous at all but the result of inflammatory reaction and will subside when the offense is removed. This I have often noticed.

There is a surgical procedure that does not involve manipulation of the lesion, that is less bloody, requires less sponging, tying and opening of raw surfaces; a procedure that seals the open vessels, and is in itself lethal to the cancer cell immediate and adjacent; and finally, what is not to be lightly considered, has no operative mortality. Why not give it the benefit of the doubt since it cannot possibly be as bad as the cold steel operation?

Heat, and of a comparatively low degree, has been proven over and over again to be lethal to cancer cells. Cancer cells are rendered impotent or killed when exposed to a temperature of 113 F. for ten minutes, whereas differentiated tissue cells require 140 degrees for a like time for their destruction. This fact is appreciated by most surgeons, but the difficulty of its application has been the drawback. Successful technic in the use of heat in cancer surgery is more difficult to acquire and to apply than that of the knife. Heat surgery requires complicated apparatus in charge of the surgeon's own trained staff, for in no other type of surgery is teamwork more necessary. The surgeon who applies this agency must know the effect of different degrees of heat on the tissues involved. He must select the type of instrument necessary to apply the degree of heat demanded in the particular operation or stage of the operation in progress. The dissecting process requires red or white heat, quickly and deftly applied with a knife-like electrode. Hemostatic effects are produced by dark heat which seals by coagulation. Dark heat or cold cautery is demanded where deep heat penetration is desired as with the Percy cautery. Here heat must be maintained in contact for a considerable time without tissue carbonization. Carbonization or burning prevents heat penetration. White heat burns; dark heat cooks or coagulates. In many of the conditions where I formerly used the Percy cautery for deep heat penetration I now use electro-coagulation or surgical diathermy.

The last few years electro-coagulation has received a great deal of attention in this country. It is the finesse in heat application in cancer surgery. It admits of fine adjustment, from mass destruction to the delicate desiccating spray. For many years I have used the cautery exclusively in all my cancer work. This includes hysterectomies for uterine cancer as well as breast amputations. Without going into details I know my results have been better by comparison with the results of cutting surgery. Breast amputations are done with the cautery knife. If the technic is correct, dissections can be made just as rapidly and with as delicate precision with the hot knife as with the cold. The knife should be glowing and with instantaneous touches the tissues are severed and no time is given for the heat to be transmitted where it is not wanted. The removal of glands, for instance those adjacent to delicate structures, can be accomplished with the utmost accuracy and without fear of injury. Those witnessing the hot knife dissection for the first time or unfamiliar with the postoperative course often remark that there must be a lot of after-pain and

interfered healing. The opposite is true. There is usually less pain and the healing is just as good, if not better, than when the cold knife is used. There is less pain because the heat obtunds nerve sensation, and the wound is not as liable to become infected. There is less oozing and serous discharge after the use of the hot knife. In other regions of the body, from which it is deemed advisable to remove malignant growths, the hot knife procedure is just as practicable. These facts are accepted by my associates, assistants, and nurses at the hospital where I have worked for many years.

The last two or three years I have used electro-coagulation extensively, often in conjunction with the cautery knife. When lymph glands are to be treated I do not dissect or dig them out, but thrust in a diathermy needle and coagulate them. I have used the radio knife extensively and it is a surprisingly delicate and effective way of separating tissue. The radio knife is the term by which this instrument is best known; so-called because the energy is furnished by modification of the transmitter circuit of the radio outfit. The process is called "Endotherm" by Wyeth, and Kelly prefers the name "Acusector." The tissues are separated by undampened waves of the high-frequency current applied through a needle. The process is not cutting as is usually understood, but a molecular disintegration by the formation of an arc between the needle and the tissues. If the needle is pressed on the tissues no arc is formed and the structures retain their integrity. The line of separation is slightly coagulated and consequently less bleeding ensues. There is little heat produced, and the wound heals as well as after the use of the knife unless the technic is faulty.

The fundamental principles of the application of heat in the treatment of cancer were established in 1889 by Dr. John Byrne of Brooklyn. Dr. Byrne reported 20 per cent of his cases of cancer of the uterus treated by high amputation of the carcinomatous cervix by knife cautery as alive and well five years after. There was no operative mortality. Who does better today, especially when we consider the lateness at which he must have received his cases?

My practice in cancer of the cervix is as follows: If it is limited to the cervix, a high amputation is made by the cautery knife or its destruction is effected by electro-coagulation. If there is uterine fixity, indicating involvement of parauterine tissues, I resort to electro-coagulation or the Percy cautery. Outward exuberant cancer growths are destroyed by electro-coagulation; and the basic growth is treated by further electro-coagulation or cold cautery as seems best in that particular case. I have an antipathy for fixed methods.

Give cancer the heat treatment; for after all it is heat that does the business, whether actual cautery, electro-cautery as administered by low frequency current, or high frequency electro-coagulation or desiccation. There is no virtue in the electricity except the heat it furnishes. However, there is this about the heat produced by the high frequency current: it is generated in the tissues by tissue resistance. A large or indifferent electrode is placed on any convenient body contact. The active electrode is a needle point. The de Arsonval current is then passed through the body of the patient and is concentrated at the needle point in or around the growth to be destroyed. The needle itself does not get hot, but the surrounding tissues do, so that there is coagulation immediately around the needle. Around the coagulated zone for an indeterminable distance there is a sub-coagulation temperature. In this zone there is a temperature that it is reasonable to suppose is a menace to cancer cells without devitalizing the normal tissues. Herein lies the advantage of surgical diathermy. All other heats are of extraneous origin; that is, the cautery point is hotter than the surrounding tissues.

We have in preparation a paper wherein we set forth in detail the indications and advantages of the various operative measures calculated to give the best results. The utmost confusion exists regarding the nature, differences and applicability of the various surgical thermic agencies. These resources include what is designated by Howard Kelly and his associates of Baltimore as "The New Surgery."

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EDITORIAL

The State Meeting

During the past two years there has been a noticeable awakening of interest in our State Medical organization. Our president, Dr. H. M. Johnson, with a group of members inspired by him, has been largely responsible for this. The association never had a more devoted member than President Johnson, who as chairman of the legislative committee in 1925 and president in 1926, has worked so effectively and at great personal sacrifice for the good of the profession in this state.

Encouraged by what has already been accomplished in legislative affairs and in improved organizational administrations under our secretary, Dr. E. A. Meyerding, and bent on making greater strides in the future, our members have been willing to dig down into their pockets and furnish the wherewithal. The members do not object to spending their money in dues if they get something for it.

One matter in which the association should act and is going to act, is in relation to the attitude of Dean Lyon of the University Medical School towards medical practice. The unfortunate radio speech made by the dean over WCCO, February 5, 1926, in which he extended an invitation to people all over the country to come to the University Hospital as private patients, rightfully aroused the profession of the state. The admission of pay patients to the University Hospital is a matter of policy and may well be a necessity in order to obtain high-grade professors. Usual medical ethics, however, prohibit the use of such methods to obtain private patients. If the radio speech mentioned is an attempt to further the cause of state medicine, as some believe, it is a step with which the members of the State Association are, to say the least, not in sympathy. The Dean's views on the desirability of socializing the practice of medicine are well known. We do not question his sincerity when he made the statement at the Annual Congress on Medical Education, Medical Licensure, Public Health and Hospitals, on March 10, that "The sooner physicians get over their unfounded opposition to the socialization of medical practice and begin to work for it, so far as it may be necessary to secure good medicine for all the people, the better it will be for the people and for physicians." We heartily disagree.

The State Medical Association has repeatedly taken a stand as opposed to the socialization of medicine. This opinion has been reiterated in the journal from time to time. There is no sympathy between the medical profession of the state and the views expressed by Dean Lyon. Socialism seems to be the issue.

Instead of going into personalities or endless discussion, the House of Delegates simply passed the resolution which appears on page 351 of this issue, and the committee after a careful inquiry will take the matter up with the University authorities.

After watching the course of the recent state meeting we cannot but feel that our meetings should have more section gatherings. The combined meetings are of value, but we would recommend a happy admixture of section and general gatherings next year.

We do wish to mention here the inspiration which Dr. Charles P. Emerson, Dean of the Indiana

University School of Medicine, brought to our meeting. His speech at the banquet was a gem and we hope to be able to reproduce it for our readers at a later date.

We were particularly fortunate in having Dr. Morris Fishbein at the convention. His address on Fads and Quacks was not only instructive, but most entertaining.

It can be said without fear of successful contradiction that the meeting as a whole was a great success.

The Dallas Meeting

The recent meeting of the American Medical Association, held at Dallas, April 19 to 23, was a most satisfactory one from every point of view. It was the first time that the association has held a meeting in the great state of Texas, and the very hospitable entertainment tendered the association by the people of Dallas was ample evidence that the House of Delegates made no mistake in choosing that progressive city for its 1926 meeting.

The House of Delegates met promptly at 10 A. M., April 19, and 114 delegates were registered at the opening of the first meeting. All meetings of the House of Delegates were characterized by earnestness on the part of the delegates and the prompt dispatch of the business of the association, under the able leadership of the Speaker, Dr. F. C. Warnshius.

Dallas furnished exceptional facilities, both in hotel accommodations and in housing the technical and scientific exhibits, and in meeting places for the various sections of the scientific assembly. All these were housed at the Fair Park, the exhibition buildings of which were admirably adapted for exhibits, both technical and scientific. Hardly as much could be said for the meeting places for the sections, as these were necessarily portions of the building partitioned off with the usual disadvantage of such temporary quarters, in their lack of light, ventilation and proper acoustics. The accommodations, however, were quite as good as at other meetings in the recent past.

The technical exhibit was at all times the center of attraction and in size and diversity of exhibits has seldom been equaled. The growing interest in the scientific exhibit attests its value, and it is safe to say that it was by far the most popular, judging from the number of doctors who visited it. We regret that space does not permit mention of some of the more important exhibits.

As in previous meetings, fresh anatomical material illustrating interesting pathological processes was shown and demonstrated by competent attendants. Diagnostic clinics, illustrated by lantern slides and moving pictures, were a source of great interest, and attracted large crowds.

There were registered 4,179 members of the association in attendance at the Dallas meeting, the largest number to attend any meeting held in a southern city. The medical profession in Texas is well organized and the profession turned out almost to a man.

The program of entertainment arranged for the visiting doctors and their wives by the local committee of the Dallas County Medical Society deserves especial mention. Seldom has anything been attempted on so large a scale as the barbecue luncheon held at the Fair Park, Wednesday noon, tendered by Dr. and Mrs. John Dean and the Dallas County Medical Society. Notwithstanding a downpour of rain all day Wednesday this luncheon was served to all who cared to partake. In the evening, section entertainments were tendered at the various hotels. On Thursday a Mexican dinner was served at the Fair Park, and on Thursday evening the President's reception and dance. Dallas lived up fully to tradition in extending to the members of the association a generous southern hospitality.

By strange coincidence the meeting of the association took place on the week of the 90th anniversary of the battle of San Jacinto, which means so much to the Texans, for from that day they date their independence from Mexican rule. April 21 is for them their most significant holiday.

The meeting was characterized by a splendid program, and no one who attended could have failed to bring away with him a higher appreciation of the great organization to which he belongs.

The House of Delegates elected for its next President, Dr. Jabez N. Jackson, of Kansas City, there being no other name proposed; for Vice President, Dr. John O. McReynolds, of Dallas, Texas, was elected.

Washington, D. C., was selected as the place of the meeting in 1927.

F. L. R.

The Blood Picture in Pertussis

In the present age of elaborate and complicated blood tests as diagnostic aids, many of the earlier and simpler ones are frequently overlooked and not utilized to their fullest value, for example, the total leucocyte and differential white cell count in pertussis. At the present time much is being written of the blood chemistry, especially the phosphorus content in pertussis, but such determinations call for more complicated apparatus and technical assistance than is available in the offices of the majority of physicians. On the other hand, a white and differential count is easily done while the patient waits, and is of real value in making a diagnosis in pertussis. A child who is coughing may or may not have pertussis and an early diagnosis will be of great value in the prevention of contact cases.

From 1905 to 1911 the literature contained many references to the white and differential count as a diagnostic aid in whooping cough, but since that time, although still recognized, it has not been utilized to the fullest extent. In the catarrhal stage there is a moderate leucocytosis with a high percentage of lymphocytes, which distinguishes it from respiratory infections where the leucocytes either remain normal in number and relationship or else show an increase in number, as well as percentage, of polymorphonuclears. In the paroxysmal stage of pertussis the increase in both total number and percentage of lymphocytes is yet more marked, but this ceases to have diagnostic interest since by this time the clinical symptoms are very typical. A slight eosinophilia up to 3 per cent is sometimes found in the convalescent stage, but this rise is too slight and occurs too late in the disease to be of any significance.

The total white count as well as the percentage of lymphocytes varies with the age of the child, but in typical cases of pertussis the figures usually run high enough to put them beyond the borderland into the definitely pathological class. In blood examinations made at the Miller Clinic on 100 children coming in for general examination, or for treatment for conditions other than whooping cough, there was an average leucocyte count of 9,300, with an average of 48 per cent polymorphonuclears and 50 per cent lymphocytes. On the other hand, blood examinations upon 100 children suffering from whooping cough in the early stages showed an average leucocyte count of 15,300 with 41 per cent polymorphonuclears and 56 per cent lymphocytes. From these results it seems that there is comparatively little difference between the percentage of lymphocytes in the two series, but when the total leucocyte count is taken into consideration it becomes apparent that there is a great difference between the total numbers of lymphocytes in the two groups.

There will always be borderline cases where the blood count will be of little value in a differential diagnosis between pertussis and acute respiratory infections, but in the majority of cases this simple procedure will be a very material aid. Many of the cases in the pertussis group showed a high count, 19 per cent being above 20,000, and they ran as high as 41,000. The percentage of lymphocytes went as high as 85 per cent, and in 22 per cent of the cases it was above 70 per cent. Therefore, with a total count above 15,000 and a percentage of lymphocytes of 60 per cent or above, in a child who is coughing, the blood examination is of material help in making the diagnosis of pertussis.

MARGARET WARWICK.

Dr. John Van Reed Lyman: An Appreciation

Although our Journal is primarily most vitally interested in the local happenings of our own state, we cannot well forego the important duty of considering briefly the great loss recently sustained by our sister state, Wisconsin, the medical profession at large and the surgical profession in particular, through the death of Dr. John Van Reed Lyman of Eau Claire. The exceptional surgical ability, staunch integrity and humane character of Dr. Lyman call for more than passing notice.

Dr. Lyman graduated from Rush Medical College in 1880 and located at once in Eau Claire where he practiced for forty-five years. Early in his career he began doing surgery, a vast percentage of which was carried on in country homes after long and strenuous drives and amid great hardships. Largely through his efforts hospital facilities were created in his home city and he toiled unceasingly night and day in an effort to meet the demands of a tremendous practice. He was a giant in stature, being over six feet six inches tall, and was possessed of unlimited energy. His inherent kindness made it impossible for him to refuse calls to attend the sick regardless of the hour or the location of the patient. He therefore became the prototype of the old family physician and was known as the "family surgeon," as

he numbered among his clientele many of the third generation.

Notwithstanding his splendid physique, Dr. Lyman was the victim of a chronic gastric ailment which not only caused him great suffering at times but necessitated his relinquishing his practice for long periods upon several different occasions. In spite of this handicap his standing with the profession and people was such that upon each occasion when he resumed his practice, he found that instead of diminishing it had increased — a most unusual experience and one which demonstrates the esteem in which he was held.

Throughout his entire professional life, strenuous though it was, he always found time to cover all important medical meetings with the utmost regularity, nor was his postgraduate study limited to this method. He made frequent trips abroad and was an inveterate attendant at the well-known clinics in this country. The writer well remembers when, as a student at Rush Medical College, Dr. Lyman, whom he had known as a boy, could be seen every Thursday afternoon in the front row earnestly and interestedly attending the clinic of Dr. Nicholas Senn. Thus for many years this busy surgeon found time to leave his practice and spend each Thursday during the school year in Chicago— a true index of the kind of man he was.

His medical writings were few, as his modesty and diffidence prevented him from appearing on programs with the regularity which his experience and ability warranted. However, the articles he has written are masterpieces and his discussions were concise and logical.

Many medical organizations have felt the imprint of his splendid personality and the success of the Interstate Assembly, of which he was one of the past presidents, is due in no small part to his unceasing labors.

The characteristics of the man can be no better exemplified than by recounting an incident which took place a few years ago when the writer attended a medical meeting in Eau Claire. The meeting came to a close at 2 A.M. A physician who was Dr. Lyman's senior by a number of years was to catch the train for his home in a distant city at four. Dr. Lyman insisted upon driving him to the station, keeping him company during those hours, and when he was leaving quietly handed him railroad and Pullman tickets despite the protests of the older man, who for the time being had entirely forgotten to purchase his tickets.

During the last months of his life he sustained a fracture of the femur and was also forced to undergo a severe stomach operation. Like most physicians, he had accumulated but little of this world's goods. He had, however, and his family will have, the satisfaction of knowing that he stored up treasures of a vastly more important nature, the love, esteem and good-will of his fellows. Our profession needs more men of his type.

A Change of Address

The St. Paul and Minneapolis offices of MINNESOTA MEDICINE have been combined and are now located at 2429 University Avenue West, St. Paul, Minnesota. All communications, including material for publication, should therefore be sent to this address in the future.

OBITUARY

DR. FRANCIS R. WOODARD*

Francis Reubin Woodard was born in Madison, Ohio, July 15, 1848. He came to Rochester, Minnesota, at the age of 10, and was a pharmacist in his father's drug store there before studying medicine.

He attended the Universities of Minnesota and of Michigan, and later went to Rush Medical College, from which he graduated in 1879. Following this he took a course of clinical study in the wards of the Cook County Hospital, Chicago, and then began practice in Claremont, Minnesota, where he stayed until 1881.

Dr. Woodard carried on an active practice as a general practitioner and surgeon from 1881 to the time of his death. He was associated at one time with Dr. J. Warren Little and later with Dr. Wm. H. Newhall. He served on the surgical staff of the Asbury Hospital, City Hospital and Swedish Hospital at different periods. He was a member of the City Board of Charities and Corrections from 1886 to 1900 and president of it for many years. He was a member of the county, state and American medical societies. He joined the Minnesota State Medical Society in 1880, when Alex J. Stone was president. Dr. W. W. Mayo, father of William and Charles Mayo, was on the committee which examined his credentials.

Dr. Woodard was a member of the Athletic Club, the Masonic Lodge and the Park Avenue Congregational Church of Minneapolis.

Dr. Woodard was actively engaged in practice up until about three months ago, when he went to Florida, where he stayed until his death, which occurred at St. Augustine March 29, 1926, at the age of 78. He had completed forty-seven years of practice, including hospital and public welfare work, forty-five of which had been spent in Minneapolis.

*Read at the meeting of the Hennepin County Medical Society, held May 3, 1926.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA STATE MEETING

The fifty-eighth annual session of the Minnesota State Medical Association was held in St. Paul May 17 to 19, 1926. Of the 2,000 members, 605 registered. While the registration last year in Minneapolis reached the number 736 and the registration in recent years has surpassed this year's figures, there was no sign of waning interest.

The House of Delegates handled the various problems presented in a conservative, businesslike way, utilizing reference committees instead of resorting to endless wrangling. Perhaps the most important action taken was raising the State Association dues to $15. Present association activities and future plans so impressed the members that there was no difficulty in obtaining a four-fifths vote of the House of Delegates necessary for such an increase.

Without lengthy discussion the following resolution was passed:

BE IT RESOLVED, That the Minnesota State Medical Association disapproves of the general policy of admitting pay patients to the University Hospital.

BE IT FURTHER RESOLVED, That a committee of seven, including the President of the Association, Dr. H. M. Johnson, who shall be an active member of this committee, be appointed by the President of the Association, and after having fully informed themselves concerning the problems affecting the medical school, arrange a conference between this committee of the Association, the President of the University of Minnesota and representatives of the Board of Regents of the University to consider what the future policy of the University shall be concerning these problems and other problems which may present themselves concerning the medical school and the medical profession.

BE IT FURTHER RESOLVED, That the Minnesota State Medical Association reasserts its stand previously taken against the socialization of medicine and state medicine.

BE IT FURTHER RESOLVED, That the members of the Minnesota State Medical Association do hereby express their willingness to co-operate with the Board of Regents of the State University of Minnesota and others in authority to the end that an abundance of suitable clinical material, secured entirely from the ranks of the worthy poor, may be available for medical instruction, and pledge their support in securing public and private funds for this purpose;

BE IT FURTHER RESOLVED, That a copy of these resolutions be spread upon the minutes of this Association, and copies sent to the President of the University of Minnesota, and to the President of the Board of Regents.

A revision of the constitution and by-laws of our State Association was submitted by the special committee of which Dr. Frank Savage was chairman. The changes in the constitution, which for the most part were minor in importance, will lie over until next year. The changes in the by-laws adopted at the second meeting of the House of Delegates included: (1) provision for emeritus members; (2) privilege of the House floor to committee chairmen and A. M. A. delegates; (3) supervision by the council of expenditures in the publication of MINNESOTA MEDICINE; (4) the formation of committees on public health education, radio broadcasting, hospitals and medical education.

The following officers for 1927 were elected: President, Dr. W. F. Braasch, Rochester; first vice president, Dr. H. B. Aitkens, Le Sueur Center; second vice president, Dr. S. H. Boyer, Duluth; third vice president, Dr. F. D. Gray, Marshall; secretary, Dr. E. A. Meyerding, St. Paul; treasurer, Dr. Earle R. Hare, Minneapolis. Dr. Melvin S. Henderson, Rochester, was elected councilor for the first district and the appointments of Dr. L. Sogge, Windom, and Dr. W. A. Coventry, Duluth, as councilors of the second and ninth districts, respectively, were confirmed. Dr. W. L. Burnap, Fergus Falls, was elected delegate to the American Medical Association and Dr. John L. Rothrock, St. Paul, was re-elected to the same position. The three newly elected alternates to the American Medical Association House of Delegates are: Dr. W. A. Coventry, Duluth; Dr. O. J. Hagen, Moorhead, and Dr. R. T. La Vake, Minneapolis.

The next annual meeting will be held in Duluth in the spring of 1927.

McLEOD COUNTY MEDICAL SOCIETY

The McLeod County Medical Society held their annual meeting at the office rooms of Drs. Schmidt and Langhoff, May 29, 1926, at Glencoe, Minn.

The meeting was opened with election of officers, Dr. W. R. Schmidt being elected president and Dr. A. H. Langhoff, secretary. Topics relating to the interest of the medical profession were openly discussed.

A banquet followed the general meeting, after which papers were presented by Dr. John Shellman of St. Paul, Minn., and Dr. J. P. Schneider of Minneapolis.

MINNESOTA ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Officers for the coming year were elected at the meeting of the Minnesota Academy of Ophthalmology and Otolaryngology held in Minneapolis, May 14, as follows: President, Dr. John L. Shellman, St. Paul; first vice president, Dr. W. E. Camp, Minneapolis; second vice president, Dr. Frank Knapp, Duluth; secretary-treasurer, Dr. John H. Morse, Minneapolis. Those elected to the Council were Dr. Harold Rothschild, St. Paul; Dr. W. E. Patterson, Minneapolis, and Dr. H. E. Binger, St. Paul.

The meetings of the society are held monthly and it was decided to hold meetings in Duluth and Rochester hereafter as well as in the Twin Cities.

STEARNS-BENTON COUNTY MEDICAL SOCIETY

The annual meeting of the Stearns-Benton County Medical Society was held Thursday, April 15, at St. Raphael's Hospital, St. Cloud. Dinner was served at 6:30 and was followed by election of officers. Those elected for the coming year were: President, Dr. J. N. Libert, St. Cloud; vice president, Dr. A. F. Moynihan, Sauk Center; secretary-treasurer, Dr. P. E. Stangl, St. Cloud. Dr. C. B. Lewis of St. Cloud was elected delegate to the State Association meeting with Dr. J. H. Beaty, St. Cloud, as alternate.

Dr. Ralph Davis of the U. S. Veterans Bureau gave a Neurological Clinic following the business session.

OF GENERAL INTEREST

Dr. S. F. Herrmann, formerly of Welcome, Minnesota, is now located in Rochester, Minnesota.

Dr. C. F. Ausman of Paynesville is spending the present year in Vienna, where he is engaged in postgraduate work.

Dr. L. P. Adams has moved his practice from Sauk Rapids to St. Cloud, where he is associated with Dr. J. P. McDowell, who recently returned from Europe.

Dr. C. G. Nordin, formerly of Brainerd, has announced the opening of offices in the Lowry Building, St. Paul, where he is practicing his specialty, eye, ear, nose and throat work.

Dr. A. E. Comstock, St. Paul, was elected secretary of the State Board of Medical Examiners in April to fill the vacancy due to the death of Dr. Thomas McDavitt. The office of the secretary has been moved to 636 Lowry Bldg., St. Paul, Minn.

Summer courses at the University are scheduled to begin June 21 to July 31. Twelve University departments will offer studies during the summer, the medical school being among the number. Last year there were some 4,200 students enrolled in the two summer sessions in the various departments.

Dr. George E. Fahr, Minneapolis, was elected president of the Minnesota Pathological Society at the annual meeting held May 11 at the Institute of Anatomy, University of Minnesota. Other officers elected are: Vice president, Dr. Wallace Cole, St. Paul; secretary-treasurer, Dr. E. T. Bell, Minneapolis. Dr. A. H. Pedersen of St. Paul was elected councilor to succeed himself. Dr. F. W. Schlutz, Minneapolis, and Dr. A. R. Hall, St. Paul, were also elected to the Council.

Paul W. Farr, twenty-two years old, the son of Dr. and Mrs. Robert Emmett Farr of Minneapolis, died May 11 of heart failure, while swimming with a group of friends in Cedar Lake, Minneapolis. A graduate of St. Thomas Academy, St. Paul, where he played football, and a member of his class crew at Harvard, where he spent two years, Paul Farr was studying medicine at the University preparatory to following in his father's footsteps. The sympathy of many friends goes out to Dr. and Mrs. Farr in their bereavement.

SMALLPOX IN CALIFORNIA AND FLORIDA

From January 2 to February 20, 1926, there were 964 cases of smallpox and 86 deaths reported to the California State Board of Health. According to their weekly bulletin for February 27 the board has issued a warning that the disease is of the virulent type and has urged general vaccination.

In Florida, 517 cases of smallpox were reported in the State between December 1, 1925, and February 6, and more than 150,000 persons have been vaccinated, according to the *Journal of the American Medical Association* for March 6. The type of the disease is not stated.

With many people returning from these two winter resorts there is a probability that the disease may gain a foothold in New York State.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

EASTMAN KODAK CO.:
- Tetrabromophenolphthalein Sodium Salt-Eastman
- Tetraiodophenolphthalein Sodium Salt-Eastman

LEDERLE ANTITOXIN LABORATORIES:
- Scarlet Fever Streptococcus Toxin for the Dick Test-Lederle

H. K. MULFORD CO.:
- Pituitary Body Anterior Lobe Desiccated-Mulford
  - Tablets Pituitary Body Anterior Lobe Desiccated-Mulford, 2½ grains
  - Tablets Pituitary Body Anterior Lobe Desiccated-Mulford, 5 grains
- Scarlet Fever Streptococcus Antitoxin (Concentrated)
- Sterile Solution of Anterior Lobe Pituitary Extract-Mulford
  - Ampules Sterile Solution of Anterior Lobe Pituitary Extract-Mulford, 1 c.c.

PARKE, DAVIS & CO.:
- Corpora Lutea Soluble Extract-P. D. & Co.
  - Ampules Corpora Lutea Soluble Extract-P. D. & Co., 1 c.c.

SWAN-MYERS CO.:
- Ampules Dextrose 50 per cent, 50 c.c.-Swan-Myers

WILSON LABORATORIES:
- Pituitary Solution U.S.P.X Obstetrical
  - Ampules Pituitary Solution U.S.P.X Obstetrical-Wilson, 0.5 c.c.
  - Ampules Pituitary Solution U.S.P.X Obstetrical-Wilson, 1 c.c.
- Pituitary Solution Surgical
  - Ampules Pituitary Solution Surgical-Wilson, 1 c.c.

TRUTH ABOUT MEDICINE

Mead's Powdered Lactic Acid Milk (Cultured). — A modified milk product prepared by fermenting whole milk with *B. acidi-lactici*, drying and powdering. Each 100 gm. contains approximately protein, 29 gm.; carbohydrate, 26.4 gm.; fat, 28.8 gm.; free lactic acid, 3 gm.; and ash, 6 gm. This preparation is proposed for overcoming the so-called buffer action of cow's milk in the infant's stomach. Mead, Johnson & Co., Evansville, Ind.

Mead's Powdered Lactic Acid Milk (Acidified With Lactic Acid U.S.P.).—A modified milk product prepared by adding lactic acid U.S.P. to whole milk, drying and powdering. Each 100 gm. contains approximately: protein, 26.4 gm.; carbohydrates, 34 gm.; free lactic acid, 3 gm.; fat, 24 gm.; and ash, 6 gm. This preparation is proposed for overcoming the so-called buffer action of cow's milk in the infant stomach. Mead, Johnson & Co., Evansville, Ind.

Pollen Extracts-Mulford.—In addition to the products listed in New and Non-official Remedies and Jour. A. M. A.,

June 6, 1925, p. 1734, the following are also marketed as fourth series in five glass syringes (doses 16 to 20, inclusive) each containing 1,000 protein units: Lamb's Quarters Pollen Extract-Mulford; Ragweed Pollen Extract (Fall)-Mulford: Timothy Pollen Extract (Spring)-Mulford; Wormwood Pollen Extract-Mulford. H. K. Mulford Co., Philadelphia.

Concentrated Pollen Extracts-Swan-Myers.—(See Jour. A. M. A., May 30, 1925, p. 1634; Jan. 23, 1926, p. 277; Feb. 27, 1926, p. 625). These are marketed in 2 c.c. vials and in sets of five capillary tubes for diagnostic tests, each tube containing sufficient extract for one test. Swan-Myers Co., Indianapolis, Ind.

Scarlet Fever Streptococcus Antitoxin-Squibb.— (Jour. A. M. A., Jan. 16, 1926, p. 199). This product is also marketed in packages of 1 c.c. vials for the diagnostic blanching test containing sufficient toxin for ten tests. E. R. Squibb & Sons (Jour. A. M. A., Apr. 10, 1926, p. 1131).

Typhoid-Paratyphoid Prophylactic-Cutter. — A typhoid vaccine (New and Non-official Remedies, 1925, p. 360) marketed in packages of three vials; in packages of one 20 c.c. vial; and in packages of one syringe containing a mixture of typhoid bacilli and paratyphoid bacilli types A and B. Cutter Laboratory, Berkeley, Cal.

Parke, Davis & Co.'s Standardized Cod Liver Oil.—It has a content of fat-soluble vitamin A which is not less than 440 units per gm. and an antirachitic potency of not less than 59 units per gm. Parke, Davis & Co., Detroit.

Pituitary Solution U.S.P.X-Wilson.—An extract of the posterior lobe of the pituitary body of cattle, preserved by the addition of chlorbutanol. It is standardized to have the strength of solution of pituitary U.S.P. For a discussion of the actions, uses and dosages, see Pituitary Gland, New and Non-official Remedies, 1925, p. 260. The product is marketed in 0.5 and 1 c.c. ampules. Wilson Laboratories, Chicago.

Scarlet Fever Streptococcus Toxin for the Dick Test-Lederle.—It is prepared by growing the scarlet fever streptococcus in broth (see Diphtheria Immunity Test, Jour. A. M. A., Jan. 16, 1926, p. 199). It is marketed in packages of one vial containing diluted toxin sufficient for ten tests; in packages of one vial containing concentrated toxin sufficient for 100 tests and a vial of diluent. Lederle Antitoxin Laboratories, New York.

Scarlet Fever Streptococcus Toxin-Lederle.—It is prepared by growing the scarlet fever streptococcus in broth (see Scarlet Fever Immunity Test, Jour. A. M. A., Jan. 16, 1926, p. 199). It is marketed in packages of four vials of diluted toxin containing, respectively, 500, 1,000, 2,500 and 5,000 skin test doses; in packages of four 20 c.c. vials of diluted toxin containing, respectively, 500, 1,000, 2,500 and 5,000 skin test doses per c.c.; in packages of forty vials of diluted toxin providing ten immunizations. Lederle Antitoxin Laboratories, New York.

Ampules Dextrose 50 Per Cent, 50 c.c.—Each ampule contains 50 c.c. of a fifty per cent solution of dextrose U.S.P. Swan-Myers Co., Indianapolis. (Jour. A. M. A., April 17, 1926, p. 1213.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of March 10, 1926

The Minnesota Academy of Medicine held its regular monthly meeting at the Town and Country Club on Wednesday evening, March 10, 1926, at 8 P. M. Dinner was served at 7 P. M. There were 39 members and 3 visitors present.

The meeting was called to order by Dr. A. S. Hamilton in the absence of the President and Vice President.

The minutes of the February meeting were read and approved.

DR. H. A. H. BOUMAN (Minneapolis) reported two cases as follows:

Case 1. Two very large "loose bodies" of the knee joint. A farmer, 62 years old, was referred because he had attacks of sudden stiffness of his right knee during the past two years. His rheumatism was growing worse and the knee felt insecure, and it was larger than the other knee.

There was nothing in the family history of any import. He had always been well except at the age of 21, when he stil lived in Sweden, he had been seized more or less suddenly with severe pain in the upper 5 inches of his right tibia. The pain had been of such a character that he could never forget it. After two weeks of suffering, a doctor had been called who had him removed to a hospital, where his leg had been opened. He remained at the hospital for six months. The wound drained continuously, pieces of bone coming out at different times. After he got home the condition continued for another three months, when the wound closed. He has been free from trouble up to two years ago.

Present status: The man is in good health. His right knee is large, containing several large-sized bodies in the anterior pouches. These were removed under local anesthesia at St. Andrew's Hospital.

The points of interest are: their large size, and their structure. Growing from the nutrient substances contained in the synovia, they clearly show the outer fibrocartilage layer and the calcified inner one, surrounding a hollow space.

Case 2. Grawitz Tumor of the Left Kidney. (Specimens and slides were shown.) This woman was seen first on January 15, 1924. Her family history was good. She was 49 years old, married, in good health previously, had four children, and was still menstruating normally. At the end of November, 1923, she was in an automobile accident when the car ran into a ditch. Since then she had had severe pain at menstruation. The hips had been sore before, but now the left one had become very painful, especially in the morning. This condition continuing, she entered Northwestern Hospital for diagnosis.

She proved negative on examination, except that the uterus was too large, and the left upper horn was exquisitely tender. There was cystocele. The Wassermann was negative. Cystoscopy revealed normal urine from both sides, separately obtained. A pyelogram was not made.

After several consultations she was operated. A small fibroma was removed from the left uterine ostium. A heavy band of adhesion, passing from the sigmoid to the right round ligament and bladder, was removed. There was evi-

dence of extensive old peritonitis about the sigmoid; no diverticula. Ventrofixation was performed and the perineum repaired.

She was apparently well and free from pain at menstrual periods and otherwise, until February 11, 1926, when she had rather severe pain in the left side of the abdomen along the ureter, but without intestinal symptoms, bladder disturbance, or fever. There was little relief, and she entered St. Andrew's Hospital February 13, 1926. *X*-ray films were taken, which showed the right kidney normal, the left kidney pelvis 7 inches long and distorted extending far outward under the 11th rib. The urine, taken separately from the urcters, was twice negative. The bowel outline was normal. Her appetite was fair, and she was negative generally, except for the persistent and severe abdominal pain which was distinctly left-sided, and a large irregular tumor, inelastic, tender at its middle, situated under the left costal border and protruding slightly, could be felt along the vertebral column. This did not move with respiration and seemed fixed.

The probable diagnosis was hypernephroma, in spite of the fact that there was no hematuria.

Operation consisted of exposure by the lumbar route, with rib resection. The very large tumor was firmly adherent, and was dislodged from the diaphragmatic fossa with great difficulty. Following a division with the finger, this tumor was clamped. The ureter was identified and properly cared for. The vessels at the outer and upper corner of a sausage-like remaining mass were separated and doubly tied. There was a great deal of a yellowish, very greasy matter oozing from cyst-like pockets. We emptied several such pockets with smooth walls, attempting, with due caution, to remove as much as possible. The rounded rest tumor was about 4 inches long and 2 inches thick and was fixed along the vertebræ, the beating aorta passing in its mesial border. There was no bleeding.

About this time the anesthetist gave a warning. We had come to a tube-like pocket and the finger entered a smooth tube passing across the beating aorta and the vertebral body. While the structure was held, the assistant passed a catheter, which disappeared easily. A very large clot followed its withdrawal and a flow of dark blood. The vein was immediately well secured and sewn carefully. There was astonishingly little blood. The vessel was an inch wide. The catheter passed across the vertebra to the right side and then down, with perplexing ease.

The patient recovered rather promptly from what appeared to be a hopeless condition, and is doing well at the present time. Radium will be applied in a few days.

Hematuria is absent in 25 per cent of these cases. The relief from pain following the first operation may have been a natural remission. There was an absence of appreciable metastases.

DISCUSSION

Dr. A. Schwyzer: I remember just one case where we damaged a very large vein in this neighborhood. It was a case of carcinoma of the transverse colon. The case was almost inoperable, but it still seemed more or less movable though the carcinoma had grown toward the root of the mesocolon. The mesentery was quite fleshy there and we put on a clamp and cut above the clamp. The clamp slipped a little and in a moment there was a flooding with blood. We, of course, compressed at once, but in that short space of time there was about 10 ounces of blood lost. We had cut away a slice of the superior mesenteric vein. It was sewed laterally with fine running silk. The case terminated successfully. It showed the fierceness of the bleeding when we get into the large veins of the abdomen. That was in the big part of the superior mesenteric vein. These veins bled from both sides and the bleeding is much worse than from a good-sized artery, which has firmer walls and can therefore be handled more energetically without fear of further tearing.

These hypernephromata seem to have the quality of growing at times into the veins. This is also true of malignancy in another organ, and that is malignant goiter. In different forms of adenocarcinoma of the goiter, the tumor is liable to grow into a vein and you are liable to feel the thick cord of a vein where the neoplasm has entered.

Dr. M. S. Henderson (Rochester) read a paper entitled, "Ununited Fractures of the Neck of the Femur." Lantern slides were shown.

DISCUSSION

Dr. Cole: This study of Dr. Henderson's is very interesting and illustrates one thing which I believe Dr. Henderson touched upon but did not emphasize. There seems to be no doubt that the number of ununited fractures of the neck of the femur is decreasing throughout the country, and undoubtedly this is due to the more general use of the Whitman abduction method in the acute cases. The one other point which I think was brought out by the statistics is that the mortality in the unoperated cases and in the operated cases is about the same. There are, therefore, undoubtedly certain acute cases where operative measures are indicated in order to hurry union and make sure of good position. The choice of operation, such as whether live bone or beef bone pegs should be used, is probably unimportant.

Dr. Chatterton: I wish to emphasize only the diagnosis. The cause of many admittedly poor results is due to the fact that a true diagnosis has not been made and, if made, only meager treatment instituted. The time element was not sufficiently considered. It requires at least four months without weight-bearing to secure union, and six months in the greater number of cases; while many cases of ununited fractures give the history of only two months' treatment. Complications demanding frequent change of position in the patient are often the cause of non-union. Poor results with good treatment, because of poor physical condition of the patient, are not infrequent.

Another cause of ununited fracture is the fact that no real treatment was instituted, especially in old people where the diagnosis was not made.

Dr. Bradford brought out the idea that the presence of synovia between the fragments of bone was the frequent cause of non-union.

Dr. Smiley Blanton (Minneapolis) read a paper entitled, "Some New Applications of the Principles of Psychological Medicine."

DISCUSSION

Dr. W. A. Jones: It is very difficult to add to what Dr. Blanton has already said except that one may have

some very strong convictions that we behave and act as we do because we are inberently built that way. I am persuaded, too, tbat environment has a good deal to do with our behavior, but, compared with heredity, it has less. A great many children grow up mischievous, perhaps over-zealous and over-active, but when the opportunity presents itself they suddenly emerge into a full-grown adult or even into young manhood and perform as a human being should perform. I presume it is due to something in them that has not been brought out until a special crisis in their life has been reached or some special environment has been presented. It is sometimes almost impossible to analyze the family satisfactorily and the first analysis, of course, should be of the parents and grandparents before we can determine very much about the future of the child.

Dr. Blanton has cited an extreme case of behavior not only of the cbildren but of the family, and undoubtedly if this family had been separated much improvement might have taken place in the children, or if the family occupied a different atmosphere their relationships might be entirely different.

I still think that the old-fashioned way of bringing up some children is much more satisfactory than the new way. A good sound spanking occasionally, with the proper explanation of why it is done, is a great deal better than psycho-analyzing the child, its behavior, and its surroundings. Of course, with defective children this takes on another aspect, because tbey are primarily physiologically, anatomically, or chemically bad and they have to be cared for as any young small animal is looked after.

I have a woman under my observation who is now about thirty-five years old and who seemed like a mild, inoffensive, pleasant sort of person. She married a man twelve years ago and has had two children by him. She said the night she married this man she hated him and had hated him ever afterward. This was her starting point, and both of them evidently had started wrong; he was the aggressor and she was the innocent. She is a typical neuropsychiatric case, full of emotions, frequently uncontrollable, and easily tired out. Each spring she has had a period of three or four months in which she was partially incapacitated. Yet ber two children are smart, bright, and physically well. Will they grow into something equally promising or will they develop some of their mother's tendencies later in their young adult life? Sometimes the unexpected turns in life will bring out all the fine resources that they possess, and on the other hand we know so little about what heredity and environment will do that the question is a very difficult one to solve as to behavior.

It is presumed that most of the men here have read books on heredity and environment and are familiar with the book written by Dr. Dorsey, an anthropologist of Chicago, entitled, "Why We Behave Like Human Beings." This book is not as satisfactory as many of the others because it is fragmentary and condemnatory in that he believes that most of the other books which have materialized in the past few years are utterly useless and he has frankly stated that most of them are "bunk." But it seems to me that his own book is just as unsatisfactory as he claims the others are. He is rather discouraging in his outlook, too, as to the future of the individual; but believing as we do now in the individual and his own inherent characteristics and his environment, whether satisfactory or unsatisfactory, hc is little likely to change from what he is predestined to do. I confess that I am very skeptical about the future of the race myself. I may be more or less stubborn in the matter, but it seems to me that 90 to 95 per cent of us (and I claim to be of that percentage) are more or less feebleminded; that includes its widest meaning, from the lowest to the highest. How are we going to improve the mental status?

Dr. Schlutz: The subject Dr. Blanton has discussed is an important one in Pediatrics. Those who have been in active practice certainly realize that. The greatest difficulty I have always found was not so much the control of any factor of disability or defect due to actual disease, but rather the correction and control of environmental and social factors. We had no good mechanism to analyze or successfully treat behavior and child guidance problems. The most successful result was generally obtained if the child was entirely separated from its immediate environment, and this was generally done in difficult cases. Amazing results can be accomplished by the type of analysis and therapy described by Dr. Blanton.

I agree with Dr. Jones that a whipping is often a good thing, but it must be intelligently applied. I had a stern father who would give me a good licking with a sapling I had to cut myself, and would then demand that I thank him for it. I know now, of course, that he meant well, but do recall the anger and indignation I experienced when he made this demand.

Dr. Jones' outlook for the human race as regards mental capacities is rather pessimistic and is, I hope, not quite true. I agree so heartily with Dr. Blanton in his estimation of Freud and his theories.

Dr. Christison: This has been intensely interesting to me. However, I can't altogether agree with our pessimistic friend. I never had a whipping at home and during all my school career I had but one teacher who ever undertook to whip me and she only tried it once.

When one undertakes a study of the psychology of childhood, the first thing to do is to put oneself in the other fellow's place. I am connected with the Children's Division of the United Charities in St. Paul, and a large part of our work is the placement of children, taking them out of bad homes and putting them into "foster homes," where we have a general supervision of them. Many of these cases come to us from the courts. When one looks into their home conditions they are sometimes so deplorable that you often wonder why the child is not worse. Many of these children are amenable to reason. If you are kind to them and they are properly fed and told to do the thing that is right because it is the proper thing for them to do and not because they fear punishment, you get along very well with them.

If we could appreciate what the mind of a child really is and how it acts and what they think about the actions of their parents and elders, we might get considerable enlightenment.

I have come to the conclusion that the majority of children are like their mothers, ycu can lead them anywhere you want to but you can't drive them an inch.

Dr. Herbert Jones: It seems to me this subject is more important than the interest it gets. From Dr. Blanton's

paper dealing with the various phases, you can see what the study of behavior in children leads to. It takes us into almost every field—home, school, business, and religion. This work is so new the nomenclature has not been fully worked out. It seems to me that the world is in a rather peculiar psychological state just now as evidenced by the popular fads and fancies.

However, I think the children in the Northwest were never taken care of so well physically as they have been in the last twenty-five years or since the advent of Dr. Sedgwick. If you will look back at the way children were taken care of twenty-five years ago you can see there is a big improvement at the present time. I recall that in the early textbooks it was taught that one of the stigmata of nervous degeneration was the high-arched palate. A lot of nervous neurotic people were of that type. The orthodontists now correct that condition in childhood and you don't have nervous people from that cause. If we can do as much for the psychological condition in the next twenty-five years, it will be a wonderful improvement and the outlook for this was never so good as it is at present.

Dr. Blanton (in closing): Dr. Sweetser asks about the Mendelian law. I can perhaps best answer his question by quoting the following passage from Dr. Jennings. Dr. Jennings is one of the leading biologists in America today. He says (from "Heredity and Environment," by H. S. Jennings):

"Not only what the cell within the body shall become, but what the organism as a whole shall become, is determined not alone by the hereditary materials it contains, but also by the conditions under which these materials operate. Under diverse conditions the same set of genes will produce very diverse results. It is not true that a given set of genes must produce just one set of characters and no other. It is not true that because an individual inherits the basis for a set of characteristics that he must have those characteristics. In other words, it is not necessary to have a certain characteristic merely because one inherits it. It is not true that what an organism shall become is determined, foreordained, when he gets his supply of chemicals or genes in the germ cell, as the popular writers on eugenics would have us believe. The same set of genes may produce many different results, depending on the conditions under which it operates. True it is that there are limits to this; that from one set of genes under a given environment may come a result that no environment can produce from another set. But this is a matter of limitation, not of fixed and final determination; it leaves open many alternative paths. Every individual has many sets of 'innate' or 'hereditary' characters; the conditions under which he develops determine which set he shall bring forth. So in man, the characteristics of an educated, cultured person are as much his inherited characteristics as are any that he has. * * *

"Beyond all other organisms, man is characterized by the possession of many sets of inherited characteristics; the decision as to which shall be produced depending on the environment. The axolotl may be compared to an uneducated man, the amblystoma to an educated one. The educated man has characteristics very diverse from those he would possess if uneducated. We say, when we think of his fact, that these are acquired characters, environmental characters, due to education. This is correct; but there is a tendency to go farther and say that these are not inherited characters, which is a mistake. The characteristics of the educated man are his native inherited characters, just as truly as are any that he has. For all his characteristics depend on the conditions under which he develops, and would be diverse under different conditions, just as is true of the characteristics that develop under education. And the characters developed under education depend upon the hereditary materials derived from his parents, changing as these materials are altered, just as do all others. 'Hereditary' has no consistent meaning other than this."

The general opinion among biologists at present seems to be that among human beings nothing else is inherited according to the Mendelian law except eye color and hair color. Of course, we do inherit physical characteristics from our parents, but the law of this inheritance is not quite clear.

One of the members of the Society just asked, "What is normal?" and "What is right and wrong?" Our idea of what is normal and what is right and wrong is constantly changing. In general, the psychiatrist takes the prevailing standards, the social concept of the community he is in, in deciding what is right and wrong. Things that we thought were abnormal some time ago, we now recognize as within the limits of normality. At one time, masturbation was considered to be very abnormal, but we have since found that practically all children masturbate at one time or another, so this practice cannot be so very abnormal.

Dr. Jones seems to feel that much of the work of the psychiatrist with children is useless because children outgrow behavior difficulties. This is true. Children also outgrow many of their physical defects. But there is always a large enough percentage who do not outgrow their physical defects so that we feel that it is unwise to allow physical defects to remain untreated. Most children will outgrow rickets, but we take every precaution that we can to see that they do not develop rickets. We may say the same thing about behavior difficulties. Children may outgrow them, but a certain percentage do not outgrow their behavior difficulties. They grow up with rickety minds—timid, fearful, moody, inhibited, unsuccessful people.

The laws of discipline are not easy to formulate. The first thing that we must do is to study man with the same scientific detachment that we do the other facts of life. From this sudy, we are led to the conclusion that the behavior of people is symptomatic of some underlying cause. It is only when we are able to find out the cause that we are able to modify behavior. We must think of behavior in the same way that we think of physical symptoms. If a child has a pain, we try to find out the cause of it. If he has a temper tantrum, we must not treat the temper tantrum; we must try to find out the cause.

In disciplining children, we have three methods before us. We can give them acute physical pain, acute psychological pain, or prolonged psychological pain. This is the negative side. On the positive side, we can reward them.

John E. Hynes, M.D.,
Secretary.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SURGERY

SUPERVISORS:
DONALD K. BACON,
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THE TREATMENT OF TRAUMATIC RUPTURE OF THE KIDNEY: Miler B. Wesson (Annals of Surgery, 83:2, p. 246). Traumatic rupture of the kidney is not a rare lesion, although its treatment in the textbooks would indicate that it was very uncommon. Galen, in 1561, described subcutaneous rupture of the kidney. Since Rayer's classical work in 1839 the literature has become voluminous. Some writers have collected as many as 900 cases, and all of the tabulations are incomplete.

The subject of treatment has always been controversial, there being ardent advocates of each of the three types of treatment: expectant, conservative surgical, and nephrectomy. With the advent of the workmen's compensation insurance, other factors than pure science have complicated the problem.

Etiology. After a careful review of the literature, one is amazed at the frequency of kidney ruptures that follow inadequate force. The commonest modes of injury are (1) a blow driving the kidney against the lower ribs or transverse processes, (2) concussion, and (3) abrupt flexion of the body. Infection plays a very important part in the etiology of cases of non-traumatic rupture, but is of little causative significance in cases due to external violence.

Pathology. Tuffier classifies ruptures as (1) ecchymosis, (2) subcapsular and (3) total rupture. Urine in the cellular tissue indicates a torn pelvis or ruptured calyx, since torn renal tissue is not capable of secreting urine.

Hemorrhage can be classified in four groups: (1) hematuria, (2) perirenal, (3) intrarenal, and (4) intraperitoneal. The renal artery is sometimes torn off and stops bleeding, thrombosis occurring while there is a balance of pressure between the blood clots behind the peritoneum and the blood pressure within the artery. A large hemorrhage into the peritoneal cavity is fatal because of the lack of counter-pressure. Hematuria is generally absent because of clots in the ureter and shock is the only symptom.

Symptoms. The regulation train of events is, a fall, "felt sick," hematuria, dysuria, and shock.

Hematuria is the most characteristic symptom and is present in from 90 to 95 per cent of the cases. It is absent if the ureter is severed or if the bleeding is intraperitoneal.

Shock that comes on after several hours is due to hemorrhage, but coming on at once is due to an injury to the solar plexus.

Reflex anuria is not uncommon and may be fatal.

Pain. The nerves of a kidney are in the pelvis and not in the cortex, hence there can be no pain unless there is a pull on the renal pedicle or intrapelvic back pressure.

Treatment has not been standardized. The common procedures are, (1) expectant treatment, where constitutional symptoms are absent and hematuria alone directs attention to the probability of a kidney lesion; (2) conservative surgery (tampon, suture, etc.) for a damaged kidney with a torn capsule; (3) nephrectomy for a destroyed kidney; and (4) abdominal incision for a torn peritoneum.

The indications for an exploration are, (1) immediate severe hemorrhage, (2) steady hourly rise in pulse rate, and (3) anemia due to moderate hemorrhage over many days.

Some of the recognized indications for nephrectomy are, (1) tearing of the renal pedicle, (2) multiple lacerations of the kidney, (3) a tear extending toward the renal pelvis which is inaccessible for repair, (4) a complete tear across the ureter, and (5) hydronephrosis or other severe disease of the injured kidney.

Aside from hemorrhage, there is no other justification for operation except infection. Hematuria, in itself, is not an indication for operation.[1] Instrumentation is to be avoided when possible because of the danger of infection. Large quantities of blood in the bladder require aspiration with a clot-sucker.

The author discusses prognosis. He deplores the tendency to do a nephrectomy when expectant treatment or conservative surgery are possible. He concludes that of all the internal catastrophes, a ruptured kidney treated under modern conditions offers the best prospect for a complete recovery.

Five case reports are given and discussed.

H. E. Simon, M.D.

[1] Since hematomata are easily infected, faithful supervision of the case is absolutely necessary if conservatism is attempted.

PYLEPHLEBITIS AND LIVER ABSCESS FOLLOWING APPENDICITIS: E. L. Eliason, M.D. (S. G. & O., Vol. xlii, April, 1926, No. 4, pp. 510-522). The author reviews the literature on pylephlebitis and liver abscess following appendicitis. Various investigators give different figures for the incidence. The author gives it as from 0.1 to 0.4 per cent.

The signs and symptoms of this complication are as follows: Septic type of temperature coming on frequently after two to four days of normal convalescence accompanied by chills. Leukocytosis is high, ranging from 10,000 to 29,000. Pain is not constant; when present is in right upper quadrant and is of a pleuritic character. Jaundice is almost invariably present, although at times it is very slight. Tenderness over site of abscess or pylephlebitis is always present. Edema localized over region of lower ribs in midaxillary line is almost an invariable finding. The author considers it almost pathognomonic when associated

with preceding signs and symptoms. Nausea, vomiting, anorexia, lassitude, and emaciation are frequent symptoms. The *x*-ray aids to rule out pneumonia and usually shows an elevated fixed diaphragm; the findings are practically those of a subdiaphragmatic abscess. Urobilin is frequently found in urine. In fifty-eight of the cases abscess is single. Mortality is about fifty-four per cent, when cases are properly treated. Diagnosis is rarely made early, varying from two weeks to eleven months.

Treatment is surgical, usually drainage through the diaphragm, but also by abdominal route. The author gives the histories of fourteen cases. His conclusions are as follows:

1. Pylephlebitis and liver abscess are not identical and occur as a complication in from 0.1 to 0.4 per cent of cases of appendicitis.
2. *X*-ray and fluoroscope aid in early diagnosis by showing a high diaphragm, sometimes with restricted motion.
3. Local edema and prominent veins are valuable diagnostic signs.
4. Pain is not always present. It is noticed most when the infection is in or on the upper surface of the liver.
5. Pneumonic signs are frequently the result of lung compression, rather than pneumonia.
6. Jaundice is practically a constant symptom.
7. The presence of lassitude and anorexia is very suggestive in the diagnosis.
8. The prognosis is not universally bad, as 54 per cent recover.
9. Operation through the diaphragm is the treatment of choice.

P. G. Flothow, M.D.

APPENDICITIS IN INFANCY AND CHILDHOOD: Stanley J. Seeger (Surg., Gyn. & Obst., 42, 4, pp. 536-539). The author reports 61 operations for appendicitis in children, with a mortality of 8.2 per cent. All series show a rarity of appendicitis under the age of 2 years, reasons advanced being liquid diet, frequency of bowel movement, and the supine position.

Acute appendicitis occurs twice as frequently among male children as among females. In early childhood the symptoms are somewhat obscured. The pain is likely to occur early, in the region of the umbilicus, and later, as the peritoneal coats become involved, it shifts to the region of the appendix. Constipation is a fairly constant finding, and in children under four the presence of diarrhea is much against a diagnosis of appendicitis.

The average admission temperature for all cases was 101, and the average leucocyte count was 17,500, with a maximum of 25,100 in unruptured appendices, and 39,600 in ruptured cases.

Fixation of the abdomen during respiration is a striking sign when peritonitis is present. Because of the shallow pelvis in the child, rectal examination is of more value than in the adult. In the series, 59 per cent were ruptured, 18 per cent rupturing in the first 48 hours.

In infants, the omentum is a short, transparent structure, plainly not involved in the localization of infection. The peritoneum, also, is much less resistant to infection than is that of the adult. Operation is the treatment of choice in all but the very late cases. The McBurney incision was employed in all because it is time-saving and reduces intra-peritoneal manipulation. One of the most important post-operative complications is intestinal obstruction, which should be treated promptly, the suturing of a catheter into a loop of distended bowel often being all that is necessary.

H. E. Simon, M.D.

THE VALUE OF PERITONEAL SHEETS OF COALESCENCE IN ABDOMINAL SURGERY: Gutierrez (S. G. & O., Vol. xlii, April, 1926, No. 4, pp. 469-473). The peritoneal sheets of coalescence are remarkably serviceable in abdominal surgery. It is through their utilization that certain fixed segments of the digestive tract may be made movable.

Intestinal mobilization represents the preliminary and fundamental element in every surgical intervention on an intestinal segment that has become secondarily fixed by coalescence.

The embryology of the alimentary canal is reviewed in this article and the rotation of the primitive canal is explained. In the embryo practically the entire alimentary canal is mobile with its primitive mesentery. In the process of rotation whenever visceral peritoneum meets parietal peritoneum there is coalescence which results in immobilization of the several portions of the alimentary tract.

All blood vessels and nerves are contained in the original primitive mesentery so that the areas of coalescence offer sites for freeing fixed portions which are bloodless, and in doing this the blood and nerve supply of the mobilized portion is not encroached upon.

The author gives the methods of mobilizing the duodenum, ascending and descending colon, pancreas, and spleen when it is immobile. He applies these principles to practical abdominal surgery and shows that it aids very much in operations on the fixed portions of the colon, the pylorus and duodenum, internal hernias, retrocecal appendix, renal and retroperitoneal tumors, spleen and pancreas, and in gastric surgery, especially gastroenterostomies.

P. G. Flothow, M.D.

CONGENITAL DISLOCATION OF THE HIP: Vittorio Putti (Surg., Gyn. & Obst., 1926, 42, 4 pp., 449-452). One thousand eight hundred and seventy-nine cases are reported, in 10 per cent of which there was a family history of congenital dislocation of the hip. More than 84 per cent occurred in females, and in 39 per cent the deformity was bilateral. A curious geographical distribution was noted, a much greater frequency in the northern provinces of Italy than in the southern.

In the majority of instances the theory of mechanical origin offers the best explanation for its occurrence. According to this, the deformity is the result of chronic trauma to which the lower limbs are exposed in the second half of prenatal life. The flexion and external rotation of the legs, the lack of proportion which physiologically exists between the femoral head and the socket, the softness of the border of the socket, the physiological anteversion of the neck of the femur, all being favorable conditions

for an incipient dislocation, which becomes more evident later as the joint has to carry the weight of the body.

Diagnosis. — The typical waddling gait is sufficient to make one suspect a dislocation, and the diagnosis may be confirmed by the *x*-ray. However, it is of the greatest importance to recognize the dislocation before the patient begins to walk. If the dislocation be unilateral, the cutaneous creases of the thigh are not symmetrical, being more proximal on the dislocated side, and the inguinal and gluteal pleats are longer and deeper. The outline of the hip on that side is more prominent and the limb tends toward external rotation, and abduction is diminished. In bilateral cases, the pelvis appears enlarged, the buttocks flattened and the limbs cannot be normally abducted.

The treatment employed by the author is that of Paci and Lorenz, although open operation is resorted to when the other methods fail. After the age of 4 years in bilateral cases and 7 in unilateral cases, the indication for surgery is not so definite and any one of numerous methods may be indicated to suit the case.

Functional and anatomical success was obtained in 80 per cent of unilateral, and in 65 per cent of the bilateral cases.

H. E. Simon, M.D.

PEDIATRICS

SUPERVISORS:
CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS
ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

INTRAPERITONEAL TRANSFUSION IN INFANTS AND YOUNG CHILDREN AND ITS USE IN CONJUNCTION WITH INTRAPERITONEAL SALINE SOLUTION: Oliver W. Hill, M.D., Joe T. Smith, M.D., and Wm. R. Cross, M.D. (Archives of Pediatrics, March, 1926). Blood transfusion in infants and children is of long recognized therapeutic value. In any successful transfusion the authors would expect an increase in the blood elements within the vessels, a certain nutritional value, a hematopoietic stimulant, the supplying of certain anti-bodies as well as a general metabolic stimulant. That the intraperitoneal route will furnish the above in an available form seems to be proven conclusively by animal experimentation as well as by clinical evidence.

The authors have successfully combined intraperitoneal transfusion with intraperitoneal saline in a number of cases in which a definite increase in body fluids was indicated, as well as the stimulating and other effects of a transfusion.

Intraperitoneal transfusion is easily and harmlessly administered and is a valuable therapeutic adjunct in certain cases. This method of blood transfusion can be simply and efficiently combined with the intraperitoneal injection of normal saline when indicated.

R. N. Andrews, M.D.

AN ANALYSIS OF SIXTY CASES OF DRUG POISONING: L. M. Murray, B.A., M.B. (Archives of Pediatrics, March, 1926). During a period of six years, 1919-1924, inclusive, there were 60 cases of drug poisoning admitted to the Hospital for Sick Children, Toronto. Two-thirds of the total number in children are under 5 years and almost one-half of the total number under 2 years, whereas a smaller fraction, namely, one-sixth, were under one year.

It will be seen that one-fourth of the cases and nearly one-half of the deaths were due to strychnine poisoning, all of which resulted from small children gaining access to a bottle of A. B. S. & C. pills. The five cases of atropine poisoning were due to parents giving overdoses of atropine sulphate, in the treatment of enuresis.

One fatality, out of a total of three cases, resulted from the aspiration and ingestion of zinc stearate powder. The remaining three deaths occurred from the accidental ingestion of oil of wintergreen and toothache drops, respectively, and one of the six cases of gas poisoning resulted fatally.

The great majority of such cases could be prevented by the exercise of reasonable care on the part of the parents. It is perhaps of interest to mention four cases of resorcin poisoning. These were all cases of infantile eczema, treated in hospital by the application of a seven per cent resorcin ointment, with resulting collapse, apparently of a toxic nature due to absorption of resorcin. These cases were all treated by exsanguination and transfusion, with very gratifying results.

The use of phenacetin in small infants is to be avoided, if possible, as they do not tolerate it at all well.

Treatment.—The treatment employed, generally speaking, includes emetics, gastric lavage, and purgation, together with sedatives or stimulants as indicated. The success of treatment in this type of case depends upon the parents bringing the patient to hospital immediately, without waiting for the possible development of poisonous symptoms, and the immediate washing out of the stomach.

R. N. Andrews, M.D.

THE SIZE OF THE LIVER AND THE SPLEEN IN APPARENTLY NORMAL CHILDREN: Harry O. Zamkin, M.D. (Archives of Pediatrics, March, 1926). To summarize the author's observation on the liver, it may be noted that: (1) the liver in apparently normal infants and children has been found to vary in size from just palpable to 6.5 cm. below the costal margin in the mid-clavicular line; (2) the liver is commonly found 3.5 cm., 4.5 cm., and 5.5 cm. below the costal margin in the mid-clavicular line as late as nine years of age; (3) the liver is found fairly often as low as 3.5 cm. below the costal margin in the mid-clavicular line up to 12 years of age; (4) neither the state of nutrition nor the type of diet affected the height of the liver.

With regard to the size of the spleen in apparently normal infants and children, the author finds that: (1) the spleen was palpated below free border of ribs in 25 per cent of 2,100 normal infants and children; (2) the frequency with which they were palpated was greatest during the first year, where it was present in 41 per cent, and then became less frequent, going to 25 per cent in the group of 2 to 4 years,

18 per cent in those 5 to 9 years, and 10.6 per cent in the older children, 10 to 12 years; (3) only those cases of rickets that presented a marked Harrison's groove or a secondary anemia showed an enlarged spleen in as high as 69 per cent during the first year, and 72 per cent during the second year, so that rickets per se could not be characterized by a large spleen; (4) the type of feeding during the first year, whether the child did not receive the breast at all or for at least two months, and even six months, had no appreciable effect on the size of the spleen; (5) neither race nor nationality of parents showed an appreciable difference in the size of the spleen; (6) the presence of a large spleen was as a rule associated with a large liver.

It is just as important to give relatively as much time and attention to the examination of the abdomen for the size of the liver and spleen as is given to the heart and lungs.

Let us look for it in the normal child, and its presence in the sick child will not so often cause unnecessary alarm.

R. N. Andrews, M.D.

ACTINOTHERAPY IN PEDIATRICS: J. H. Gettinger, M.D. (Arch. of Ped., April, 1926). The biological effects of ultra-violet light are strongly pronounced when the human skin is exposed to its ray. The blood in the capillaries absorbs actinic rays. These rays have their effect upon lymph and blood channels. There is a photochemical action between the ultra-violet rays and the hemoglobin of the blood. This charging of the blood with radiant energy enables its elements to convey an increased amount of oxygen to the cells and an increased quantity of toxic gases away from the cells. The glandular tissue is also affected and its phagocytic power increased. In short, it activates the formation of antibodies.

The most valuable result of these rays is the hyperemia produced by a properly regulated dose, manifesting itself six to eight hours after exposure to the light. The hyperemia will remain for a period varying from three to ten days. The hyperemia produced by ultra-violet rays is the main effect of therapeutic beneficence. Patients who do not pigment well do not benefit so markedly under the treatment.

Some of the chemical changes that ultra-violet rays bring about in the blood are to increase its calcium content and also to increase the concentration content of inorganic phosphorus. In infectious conditions where the blood platelets were found to be diminished, ultra-violet radiation brought about a restoration of the normal number.

In malnutrition, the results have been marvelously gratifying, as it increases the oxygen-carrying capacity of the blood and arranges the hematologic elements so that the maximum opsonic index is assured, and, acting upon the sympathetic nervous system, co-ordinates the inter-relationship of the endocrine. In rickets, where there is not only a deficient blood content of calcium and phosphorus, but also a disproportion between the two salts, ultra-violet rays offer a possible solution. In cases of surgical tuberculosis, the results are almost miraculous.

R. N. Andrews, M.D.

THE USE OF MERCUROCHROME IN CHILDREN: Harry Lowenburg, M.D. (Arch. of Ped., April, 1926). The intravenous injection of substances for the control of infectious processes is employed for the same purposes and in the same manner in children as in adults with, of course, the exception as to the size and frequency of the dose. At present, judging from the author's experience and from a hurried survey of the literature, it is his feeling that the usefulness of these agents still remains to be proved, even granting their harmlessness, which, as he has seen, is by no means certain.

Those of us who too frequently stand dumb at the bedside of a stricken child, helpless to assist, are likely to add to the confusion by employing the substance in cases for which it is not suited and for which it was not intended or recommended by its inventor. Many of us, both laboratory workers and clinicians, are prone to draw hasty conclusions, to believe post hoc, propter hoc, and to give credit to a remedy for a recovery when that credit rightly should accrue to vis medicatrix naturæ.

It would perhaps be wise for great universities to establish a strict but honest censorship over the publication of all articles and papers which describe revolutionary methods or discoveries and which in particular claim new methods of cure. If this were done there would be less pain, fewer heartaches, less reactionism in medicine.

It is due the medical profession and the laity as well for Dr. Young to give us at the present time an article entitled, "The Truth About Mercurochrome and Gentian Violet," in which he will detail his failures as well as his good results,—as well as giving us any additional information he may have acquired from increased experience and give us the means of explaining our own failures or tell us frankly that his original claims were exaggerated.

R. N. Andrews, M.D.

A STUDY OF AN EPIDEMIC OF IMPETIGO IN NEWBORN INFANTS: Lloyd B. Dickey, M.D. (Archives of Pediatrics, March, 1926). From the data at hand it may be concluded that the incubation period in this series of impetigo cases was probably not more than two days. There is nothing to point to this epidemic as being an air-borne infection. The chance of transmission from internes and staff doctors, from nurses, and from mothers, is real, however.

Among the utensils in the nurseries found to be contaminated with staphylococci were the tray of the weighing scales, a supposedly sterile surface of a towel covering a tray, the bath-tank thermometer, the shade and bracket of an electric lamp hanging directly over the table where the infants are dressed, and the sink itself on which the infants are placed while being bathed. Dust from a drawer in a table on which the infants are dressed, and which contained articles such as safety pins and adhesive tape, was found contaminated with staphylococcus albus, which organism may at least be considered as an evidence of hand contamination.

The probability of the spread of the infection by means of the hands or persons of doctors, nurses, or others hav-

ing access to the nurseries, is certainly great. First remove the infant from the newborn nursery to an isolation ward. The blebs are then opened and cauterized with silver nitrate, and the infant placed in complete isolation with the usual precautions.

Daily bichloride and alcohol baths (1-2000) were begun on all babies, both those with and those without the infection. Whatever benefit might be derived from these measures as prophylactic against sporadic cases, it cannot be said in this case that they had much effect in controlling this epidemic.

The operating room training should be completed before the nurses are sent into the newborn nurseries. There should be as little communication as possible between the obstetrical wards, where babies are brought to nurse, and other contaminated wards. The borrowing of any materials or supplies by the obstetrical ward from other wards should be foregone. The use of boric acid solution may well be discontinued in newborn nurseries. It has no value as an antiseptic, and is difficult to keep from contamination.

Organisms isolated from materials in the nurseries and from blebs of patients will grow and remain alive in tap water, 4 per cent boric solution, albolene, and soap, for various periods of time.

Realization of the true method of spread, with proper precautions to prevent it, will result, the author thinks, in a greatly reduced incidence of infection.

R. N. Andrews, M.D.

ROENTGENOLOGY

SUPERVISORS:

LEO G. RIGLER,
MPLS. GEN'L HOSPITAL, MINNEAPOLIS

A. U. DESJARDINS,
MAYO CLINIC, ROCHESTER

THE IMPERFECTIONS OF THE STEREOSCOPIC MANEUVER IN RADIOGRAPHY OF THE CHEST: Waring and Wasson (Radiology, vol. 6, p. 198, Mar., 1926). In the infant, one-half, and in the adult, two-thirds of the chest radiograph is obscured by the bony parts, the ribs and clavicles. A further obscuration occurs from the mediastinum. The head-foot or vertical tube shift best obviates the bony and diaphragmatic interference, while the lateral shift best obviates the interferenec of the mediastinum and bronchial tree.

The more parallel the ribs, as in early infancy and in senile and emphysematous chests, the more can be gained by the stereoscopic maneuver using the head-foot shift. In spite of the shift many parts within the chest may be obstructed by the ribs, when seen in their true perspective. It is therefore advisable to study each one of a pair of stereoscopic films separately in addition to stereoscopically.

Special methods should be used in radiographing special parts of the lungs such as the apices. Rotation of the tube appears valueless.

Leo G. Rigler, M.D.

ROENTGEN STUDY OF FIVE HUNDRED CHILDREN FOR THYMIC ENLARGEMENT: Perkins (Am. Jour. Roent., vol. 15, p. 216, Mar., 1926). The danger of sudden death during minor operations, such as tonsillectomy, due to enlarged thymus, has not been sufficiently emphasized. Many cases of thymic enlargement exist without clinical symptoms. All children before operative procedure should be studied both clinically and roentgenologically for enlarged thymus. Congenital anomaly of the heart and enlarged thymus can be distinguished by roentgen examination, although the symptoms often simulate each other. Occasionally, however, an enlarged thymic gland may be placed so low that its shadow cannot be distinguished from that of the heart, thus rendering the roentgen diagnosis faulty.

Roentgen radiation presents a satisfactory method of treatment for enlarged thymus.

Leo G. Rigler, M.D.

EYE, EAR, NOSE AND THROAT

SUPERVISORS:

VIRGIL J. SCHWARTZ,
PHYS. & SURG. BLDG., MINNEAPOLIS

E. L. ARMSTRONG,
FIDELITY BLDG., DULUTH

AN ATTEMPT AT THE DIFFERENTIAL DIAGNOSIS OF LATERAL SINUS INFECTION: George L. Tobey, Jr. (Boston Med. and Surg. Journal, January 14, 1926). There are no authentic cases on record of lateral sinus thrombosis in the absence of ear involvement, unless there is a skull fracture or a meningitis.

The great majority of cases of acute mastoiditis, properly operated and managed, lead to uneventful recovery. If there is evidence of complication, we must consider the following: Accidental folding of the auricle; a very tight bandage; marked local reaction in the wound; furunculosis of the canal; iodoform dermatitis; erysipelas; acute cervical adenitis; involvement of the other ear; acute heart, lung, intestinal, or kidney conditions, especially pyelitis in children.

In the absence of the above, intracranial complications must be considered: brain abscess, meningitis, or a sinus infection, of which we here consider only the last. A textbook case is rarely found; a diagnosis must be made upon the findings in the individual case. The more important of these findings are usually present, in most cases, but they may vary so in degree as to obscure the diagnosis. Thus, in the acute septic type the temperature may suddenly rise to 105° or 106°, and as suddenly fall to subnormal, with chills, sweating, evidences of meningeal irritation, high leucocytosis and possibly bacteremia. Again, an easily overlooked case is that which shows an irregular temperature, yet rising no more than a degree or two above normal, and with no signs of sepsis and a low leucocytosis. There

are a dull headache, insomnia, a feeling of fulness and heaviness on the affected side, loss of appetite, lassitude and malaise, with or without bacteremia. Another type shows a temperature which rises and falls from 100° as a basis, otherwise resembling the above. Still another type is entirely afebrile, being of long standing and discovered only at operation, associated with perisinus abscess.

Interference with the venous drainage from the cranial cavity by compression of the internal jugulars causes increased intracranial pressure, with a quick rise in spinal fluid pressure which may be measured by a manometer when lumbar puncture is done. When such a rise does not appear, we diagnose a subarachnoid block, due to a tumor of the spinal cord or of the cerebellar fossa, which obstructs the spinal fluid circulation.

In sinus work the mechanism is a little different, for instead of an increased column of fluid which cannot be transmitted because of obstruction, we have a venous obliteration which prevents an increase of pressure on the affected side high up at the source.

Lumbar puncture is done with the patient in the lateral position, the spinal fluid flowing into a glass manometer of 2 mm. caliber. We note the pressure reading (normally about 150 mm.), and the pulse and respiratory oscillations. Then, without disturbing the patient, an assistant makes gentle pressure on one side of the neck between the larynx and the sternomastoid muscle, until a strong carotid pulsation is felt. The rapidity and degree of rise of the fluid column is noted, as also the quickness of the drop on release of compression. The process is repeated for the opposite jugular, and then both are compressed at once.

This procedure on the normal side causes a quick rise to twice or three times the original reading; while on the completely thrombosed side there is either no rise at all, or a slow rise of from 10 to 20 mm. in the manometer. Partial obstruction from a mural thrombus gives less striking, yet valuable, results.

For accuracy in technic we must beware of (1) incomplete compression of the jugular due to obesity or local swellings; (2) a spinal fluid of normally low tension (which may easily be brought up by injecting 10 to 20 c.c. of normal saline); (3) movements of the patient; (4) normal difference on the two sides: (a) a difference of more than 50 mm. unusual and 100 mm. rare; (b) the rise in pressure seems at times slightly less when the dependent vein is compressed; (5) possible anatomic variation in the size of the lateral sinuses, the jugular veins and their tributaries.

Of two possible dangers, sudden death from subtentorial abscess or tumor may be avoided by a previous fundus and neurologic examination. The other menace is that of acute meningitis, by escape of bacteria from a localized infection or the blood stream into the spinal fluid. These experimental possibilities have not so far become clinically manifest, and can probably be prevented by not withdrawing large amounts of fluid and by not congesting the cerebral vessels, through compression, too long at a time.

VIRGIL J. SCHWARTZ, M.D.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

HANDBOOK OF DISEASES OF THE RECTUM. Louis J. Hirschman, M.D., F.A.C.S., Ex-Chairman, Section on Gastroenterology and proctology, American Medical Association. Illus. 5 color plates. 4th edition, revised and rewritten. Cloth, $6.50. St. Louis: C. V. Mosby Company, 1926.

MODERN METHODS OF AMPUTATION. Thomas G. Orr, A.B., M.D., F.A.C.S., Prof. of Surgery, University of Kansas. Illus. Cloth, $3.50. St. Louis: C. V. Mosby Company, 1926.

FACTS ON THE HEART. Richard C. Cabot, M.D., Professor of Medicine and Social Ethics, Harvard University. 781 pages. Illus. Cloth, $7.50. Philadelphia and London: W. B. Saunders Company, 1926.

YOUNG'S PRACTICE OF UROLOGY. Based on a study of 12,500 cases. Hugh H. Young, M.D., and David M. Davis, M.D., Johns Hopkins University. With the collaboration of Franklin P. Johnson. Two volumes totaling 1,484 pages with 1,003 illustrations, 20 being color plates, by William P. Didusch. Cloth, $25. Philadelphia and London: W. B. Saunders Company, 1926.

MODERN MEDICINE. Diseases of Metabolism. Diseases of the digestive system. Sir William Osler, M.D., and Thomas McCrae, M.D. 3rd edition, revised, Volume III. 1,052 pages. Illus. Cloth, $9. Philadelphia: Lea & Febiger, 1926.

COLLECTED PAPERS BY THE STAFF OF THE HENRY FORD HOSPITAL. First series 1915-1925. 665 pages. Illus. Cloth, $8. New York: Paul B. Hoeber, 1926.

DIATHERMY WITH SPECIAL REFERENCE TO PNEUMONIA. Harry Eaton Stewart, M.D. 248 pages. Illus. 2nd edition, revised and enlarged. Cloth, $3. New York: Paul B. Hoeber, 1926.

BLOOD CHEMISTRY COLORIMETRIC METHODS FOR THE GENERAL PRACTITIONER. Willard J. Stone, M.D. 2nd edition. 142 pages. Illus. Cloth (special waterproof), $3.25. New York: Paul B. Hoeber, 1926.

THE INTERNATIONAL MEDICAL ANNUAL. A Year Book of Treatment and Practitioner's Index. Forty-third year. Pp. 548; 43 plates and 87 illustrations. New York: William Wood & Co., 1925.

This book in short articles on all subjects of medicine and surgery including the specialties, gives the most recent conception of the subjects with the advance made during the last few years. It also gives the diagnosis, prognosis and treatment of all conditions mentioned with especial attention to the new methods and discoveries. The articles are arranged alphabetically and there is a comprehensive index. The print is rather small, but clear and easily read. It is a very valuable reference book for any physician, but especially for the busy practitioner. WM. W. MOIR, M.D.

OLD AND NEW VIEWPOINTS IN PSYCHOLOGY. Knight Dunlap, Prof. of Experimental Psychology, Johns

Hopkins University, Baltimore, etc. 166 pages. Cloth, $1.50. St. Louis: C. V. Mosby Co., 1925.

This volume consists of five chapters, dealing respectively with Mental Measurements, Present Day Schools of Psychology, Psychological Factors in Spiritualism, The Psychology of the Comic, and the Reading of Character from External Signs. The author calls attention to the fact that there is a great deal of application of the Binet-Simon tests by persons extremely incompetent. He stresses the fact that sufficient training is required to fit one to successfully apply and interpret these tests. He believes that the promotion of research in the field of mental measurements is a vital need. He discourages the statistical evaluation of routine tests. In his other chapters he enters into a discussion of complexes, dreams, the sense of humor and touches on Freudianism. He takes up the causes of popular belief in Spiritualism and devotes some space to a discussion of the honesty and sincerity of mediums and to the qualifications of those who investigate them. The book embodies the author's ideas as portrayed in lectures delivered by him and on criticisms of two of his colleagues in the Department of Psychology of Johns Hopkins University. It will appeal to those who are interested in this particular branch of medicine.

W. H. Hengstler, M.D.

THE PRACTICAL MEDICINE SERIES. Gynecology and Obstetrics. Vol. V. Edited by Thomas J. Watkins, M.D., F.A.C.S., and Joseph B. De Lee, A.M., M.D., in collaboration with J. P. Greenhill, B.S., M.D. 534 pages. Illus. Cloth, $2. Chicago: The Year Book Publishers, 1925.

The Gynecological section of 230 pages is edited by Thomas J. Watkins; the Obstetrical section, slightly larger, by De Lee, with the collaboration of J. P. Greenhill.

The book includes an illuminating and usable series of abstracts from the literature up to and including most of 1924. Editorial comment is often clarifying, and occasionally assists the reader in his selection of method and treatment from an assortment described.

The following gynecological subjects are developed at some length: the ovary, its physiological and anatomical pathology; the uterus, its displacements and their surgical correction, including plastic surgery of the pelvic outlet; pelvic infections, including gonorrheal infections and the cautery treatment of endocervicitis; tumors, with a considerable discussion of surgery; *x*-ray, and particularly radium, in the treatment of fibroids and carcinoma; there are a number of helpful discussions of sterility which are continued into the sections on obstetrics.

The non-interfering policy in the treatment of abortion is stressed. The editors regard tuberculosis as a dangerous complication of pregnancy, with early induction of abortion as the rational treatment.

The figures of Belding and Hunter in a study of clinical syphilis and fetal deaths indicated that syphilis causes 27 per cent of all previous fetal deaths in Wassermann-plus women, and of 64 per cent in clinical syphilis. Their figures in all hospital fetal deaths indicate that 41 per cent in Wassermann-plus women and 82 per cent in clinically syphilitic women are due to syphilis.

The toxemias are given a generous space; the editor regrets that the blood chemistry in toxemias cannot be used in prognosis or as a guide to treatment. "Eclampsia," says the editor, "is not a fully preventable disease, though a very great deal can be done in this direction." Harris' paper on the after-effects of the late toxemias is given at length. "The absence of signs of nephritis," he says, "three weeks after delivery do not preclude the possibility of permanent renal damage." De Lee's scheme for designating the degree of engagement is given. The editor admits only one indication, abruptio placentæ, for the use of pituitrin.

Obstetrical analgesia and anesthesia of some seven varieties are discussed.

"Forceps," says the editor, "are used too often by men who do not know how to apply them, and not often enough by those who do." The Kielland and other forceps are discussed. There is a long discussion of caesarian section with emphasis upon the advantages of the low, or cervical type.

There is a lengthy discussion of placenta previa and abruptio placentæ, including detailed treatment procedure.

Varied types of sepsis, their cause and treatment, are discussed.

Glandular disturbances, hemorrhages, deformities, and anomalies in the newborn are covered in the closing pages.

E. C. Hartley, M.D.

PHARMACOPEIA OF THE UNITED STATES. Tenth Decennial Revision. By the authority of the United States Pharmacopeial Convention. Prepared by the Committee of Revision and Published by the Board of Trustees. Official from January 1, 1926. Philadelphia: J. B. Lippincott Company.

There is contained an interesting history of the organization and continued arrangement of the pharmacopeia. Early in this edition one finds a section which details the variations of this volume over the preceding edition. A numerous and extensive listing of the various drugs which are used in the treatment of diseases throughout the United States is given. The discussion on each drug contains its description and physical properties, tests for its identity, purity, assay, methods of preservation and average dose. In some instances, the more common preparations are included. Formulas for certain preparations are given, as extracts, infusions, liquors, tinctures, unguents, smallpox vaccine, etc. At the end of the book there is a brief yet inclusive exposition on general tests, processes, and apparatus commonly used in pharmaceutical and chemical projects.

The value of the United States Pharmacopeia is little realized. Probably its most noteworthy achievement has been its stabilizing of the drugs and foodstuffs throughout this portion of the world, and probably also an influence of similar nature over the entire world.

Daniel H. Bessesen, M.D.

PYGMALION, OR THE DOCTOR OF THE FUTURE. R. M. Wilson, M.B., Ch.B. 68 pages. Cloth, $1. New York: E. P. Dutton & Co., 1926.

Everyone is familiar with the Greek story of the master

sculptor who created such a lovely vision that the gods granted her life. In this book, the author has compared the practice of medicine to this statue in the making, feeling that medicine has been practiced upon a physical basis and believing that the future of medicine must be endowed with the study of the mentality and spirit of patient; that is, the practice of medicine must be endowed with life and must take for its sphere the study of life.

Plato, in one of his earliest dialogues, "Charmides," states "that as you ought not to attempt to cure the eyes without the head, or the head without the eyes, so neither ought you to attempt to cure the body without the soul—and this is the reason why the cure of many diseases is unknown to the physicians of Hellas."

Pygmalion is an excellent book and explains how it has been possible for various cults to realize success of a practical sort, and also in a way portrays how future medical practice will be able to adapt itself in more thorough and complete fashion to the study of the mental and spiritual side of the patient as well as to the physical. It would be a nice volume to have in every doctor's waiting room.

DANIEL H. BESSESEN, M.D.

EARS AND THE MAN: STUDIES IN SOCIAL WORK FOR THE DEAFENED. Annetta W. Peck, Estelle E. Samuelson and Ann Lehmann, New York League for the Hard of Hearing. Introduction by Wendell C. Phillips, M.D. 217 pages. Cloth, $2. Philadelphia: F. A. Davis Company, 1926.

This very interesting book, written by three women who are not physicians, is particularly interesting to the otologist. It shows that the duty of the otologist does not end with the verdict of permanent deafness, or with such treatment as may be administered along the lines of prevention and cure.

Deafness is considered in its relation to the mind, the eyes, the job, play and education.

An interesting chapter relates to the experiences with the various aids to hearing. It discusses the equipment which should be in every auditorium, church, etc.

The social service work is greatly emphasized and justly so. Finally it deals with methods of education and publicity for the benefit of the deafened. The subject is considered from the standpoint which is most frequently neglected by the busy otologist, but nevertheless a most important one to the patient.

K. C. WOLD, M.D.

IMPORTANT NOTICE — University of Bordeaux of France, under personal supervision of Prof. Georges Portmann, will give a five weeks' intensive postgraduate course COMMENCING JULY 8, 1926. Course consists of Bronchoscopy, Plastic and Goiter Surgery, Mastoid, Neck and Nose and Throat Surgery. Class limited to 12 physicians. Fee for entire course, $200. For information apply to Dr. Leon Felderman, 4428 York Road, Philadelphia, Pa.

LOCUM TENENS wanted, to begin July first, by Minnesota graduate. Address R. M. O'Rourke, Ancker Hospital, St. Paul, Minn.

OFFICE POSITION WANTED — In Minneapolis or St. Paul by young lady with general office experience. Good references. Address C-84, care MINNESOTA MEDICINE.

EXPERIENCED LABORATORY TECHNICIAN desires position in Twin Cities or vicinity. Capable of doing blood counts, urinalysis, Wassermann, serology, blood chemistry, gastric analysis, tissue staining and milk and water analysis. Address C-81, care MINNESOTA MEDICINE.

WANTED—Internist and oculist and aurist to become associated in a Minneapolis clinic. Address C-82, care MINNESOTA MEDICINE.

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WANTED—Salaried appointments for Class A physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

PRACTICE FOR SALE—Minnesota city of 7,000 population. Principally office and city practice. Unusually complete office equipment, *X*-ray, etc. Must sell because of illness. Address C, MINNESOTA MEDICINE.

TUBERCULOSIS

June 28-July 3, 1926

A one-week short course in Tuberculosis for general practitioners will be held by the University of Minnesota Medical School at the University and at Glen Lake Sanatorium on the above dates. Lectures and clinics by specialists. A large number of patients and special clinical facilities at the Sanatorium. Fee for the week, $25.00.

A short course in Tuberculosis for nurses will be held at the University and Glen Lake the week of June 14.

For information, address

General Extension Division, University of Minnesota, Minneapolis

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association Northern Minnesota Medical Association and Minneapolis Surgical Society

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CARCINOMA OF THE LARYNX*

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Mayo Clinic
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In spite of educational measures and propaganda concerning carcinoma many patients with extensive inoperable carcinoma of the larynx are still being treated without a laryngoscopic examination. This condition is quite lamentable, especially because the diagnosis of carcinoma of the larynx is not difficult in most cases, and the results of early surgical treatment of the lesion in this region are excellent.

During 1925 there were forty-four patients with carcinoma of the larynx examined at the Mayo Clinic. The condition was operable in only thirteen; of these thyrotomy and excision of the lesion was possible in only three, and in ten laryngectomy was necessary.

Carcinoma of the larynx usually begins on one vocal cord, and the first symptom is a recurring hoarseness about which the patient consults his home physician. The physician, not thinking about the possibility of malignancy, or feeling that if the condition is malignant little can be done, gives some general or local treatment. He does not refer the patient to a laryngologist until the late signs of the disease appear, such as pain in the throat and ear, dyspnea, dysphagia and cervical metastasis, when little permanent benefit is possible.

The usual differential diagnosis of carcinoma of the larynx includes chronic laryngitis, tuberculosis, syphilis, pachydermia and benign growth. With the usual laboratory data, roentgenogram of the chest, the Wassermann test, examination of the sputum and the laryngoscopic picture, the diagnosis in most cases is not difficult. However, biopsy may be required in some cases to establish a diagnosis. Sometimes the specimen is not taken at the juncture of the normal mucous membrane and the lesion, in which case the piece of tissue the pathologist sees is inflammatory and not part of the tumor. On this account radical treatment for malignant conditions is frequently delayed. Tissue should never be removed previous to operation in cases in which thyrotomy is performed regardless of the nature of the tumor, as microscopic examination can be made at that time, but when laryngectomy is the operation selected, biopsy should be made just beforehand, with the patient's consent to the operation if the lesion should prove to be malignant.

Clinically, carcinoma of the larynx has been divided into two groups: (1) the intrinsic, in which the growth arises from the vocal cord, the ventricles, the ventricular bands, the interarytenoid and subglottic regions, and (2) the extrinsic, in which the growth arises from the epiglottis, the arytenoids, the aryepiglottic folds, and the posterior surface of the cricoid cartilage.

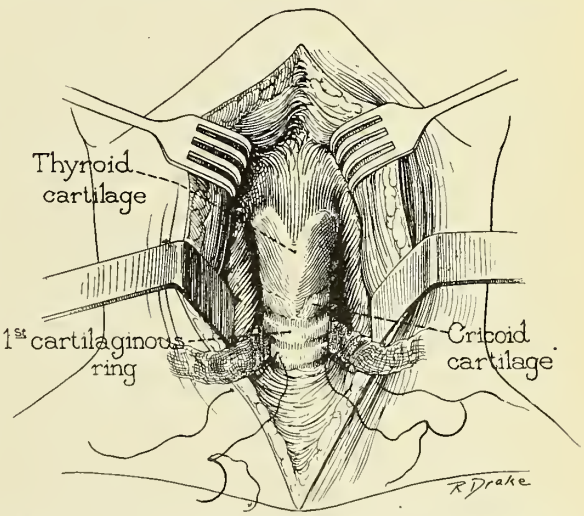


Fig. 1. First stage laryngectomy. Hyoid bone divided and retracted. Larynx and trachea skeletized. Gauze packs placed down to the esophagus. Trachea sutured to skin.

Epithelioma of the larynx should be removed surgically. The operation in the individual cases is determined by the situation of the lesion, its extent, grade of malignancy, and the patient's general

*Read before the Minnesota State Medical Association, St. Paul, May 17 to 19, 1926.

condition. The grading of epithelioma, as formulated by Broders, is a definite advance in determining the treatment advisable for such growths in the larynx, as well as elsewhere in the body. The microscopic grading will sometimes determine

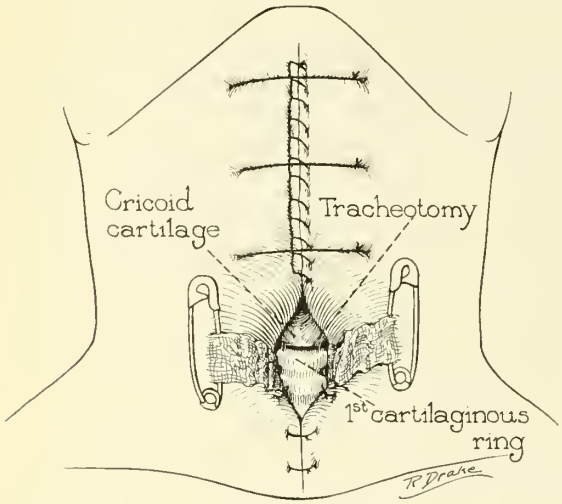


Fig. 2. Trachea opened and gauze packs replaced in four or five days.

whether the operation should be thyrotomy or laryngectomy. A low-grade epithelioma of the vocal cord may be cured by thyrotomy, whereas if the lesion proves to be an epithelioma Grade 4 microscopically, laryngectomy may be preferable. It has recently been conceded by most radiologists that although roentgen rays and radium have apparently cured a few patients, many more patients have suffered from recurrences following this treatment. Such treatment should be limited to the extrinsic cases and a small number of intrinsic cases in which certain factors contraindicate operation. The treatment may also be used in surgical cases before and after operation. Surgical diathermy, either with or without thyrotomy, has been advocated for carcinoma of the larynx, but I feel that it does not offer the patient the best chance of getting entirely rid of the trouble and there have been reports of sloughing of the cartilage following this treatment.

It is possible to remove a very small low-grade epithelioma perorally with good results. This, however, is not the treatment of choice. In early cases with involvement of the anterior two-thirds of one vocal cord without fixation, thyrotomy and removal of the growth down to the cartilage is the ideal treatment for carcinoma of the larynx. A scarred band, which sometimes very closely simulates a vocal cord, fills the space which was occupied by the lesion. The normal vocal cord approximates this scarred band, and a good voice results.

It appears that in England the diagnosis of carcinoma of the larynx is made earlier than in this country, and therefore this operation is possible in a larger number of cases than here, where the delay in diagnosis and extent of the growth at the time of examination limit the application of this procedure. The percentage of cures in cases recurring postoperatively is small, so that those subjected to conservative treatment should be carefully selected. The growth is usually from one-third to one-half larger than it appears at the time of examination, and in questionable cases laryngectomy is safer than an attempt to remove a large growth by means of thyrotomy. All major laryngeal operations are performed with the patient under paravertebral anesthesia, as advocated by Labat, Meeker and Lundy. This is a distinct advance over the previous general or combined general and local

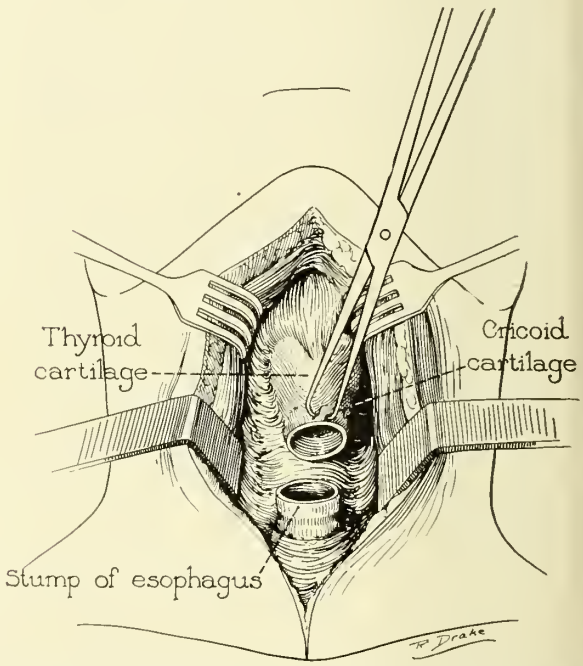


Fig. 3. Second stage laryngectomy. Larynx is removed from below upward, eight or ten days after first stage.

anesthesia. The anesthesia in most cases has been perfect, both from the operator's and the patient's standpoint.

When thyrotomy and excision are selected a median incision is made, the hyoid bone split with

bone forceps, and the ends retracted. The thyroid cartilage is sawed through with a small handsaw, the wings being held with special laryngeal forceps. The growth is then removed down to the cartilage. The larger vessels are tied and the wound closed. The cartilage itself is not sutured, but the thyroid-hyoid membrane and the perichondrium are sutured with catgut. Tracheotomy is not performed, and I have never seen a case in which dyspnea was so severe as to require tracheotomy. It is essential that a small rubber tube be placed in the lower part of the wound up to the cartilage for at least twelve hours in order to prevent surgical emphysema if the skin should be tightly closed.

When laryngectomy is chosen a two-stage operation is employed, following the technic that Judd has used. The patient is fed by a Rehfuss tube inserted through the mouth during the first day or two following the first stage and following the second stage of the operation.

At the first stage a median-line incision is made from the symphysis of the jaw to the manubrium.

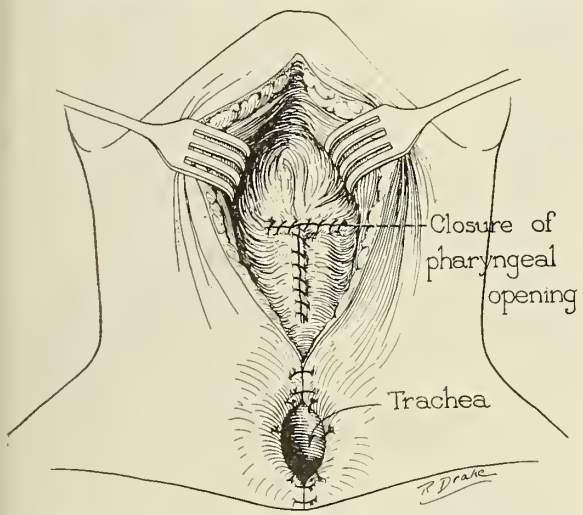


Fig. 4. Second-stage laryngectomy. Note the closure of the pharyngeal opening with two rows of catgut sutures and the suturing of skin about the trachea.

The hyoid bone is divided with bone forceps and the cut ends retracted. The isthmus of the thyroid is divided and the larynx and trachea skeletized. A piece of iodoform gauze is packed laterally to the trachea, just below the cricoid, down to the esophagus, as employed by Dinsmore, but it is not carried back of the trachea. This gives the same amount of protection as when the gauze is carried back of the trachea, without the risk accompanying the latter (Fig. 1). The margin of the skin is sutured to the trachea with chromic catgut about the second tracheal ring, at a point just below where later a tracheotomy would be made. The rest of the wound is closed loosely. In about four or five days the trachea is opened by a parallel

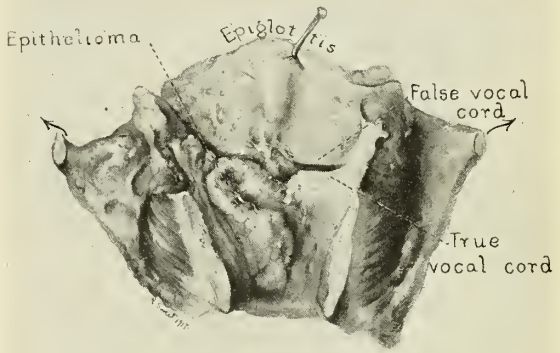


Fig. 5. Carcinoma of the larynx, showing extension of the growth well below the vocal cords. This extension is sometimes difficult to determine by laryngoscopic examination.

incision usually just below the cricoid cartilage, without injuring the tracheal rings (Fig. 2). The iodoform packs on either side of the trachea are not changed.

In about eight to ten days after the first stage the larynx is removed from below upward, and in cases with possible involvement of the posterior part of the larynx, the pharynx is opened and the larynx inspected from above, as suggested by MacKenty, in order to avoid cutting into the growth in the arytenoid region (Fig. 3). The pharynx is closed with two rows of chromic catgut sutures, care being exercised to get an accurate approximation (Fig. 4.) The trachea is sutured to the skin with silkworm and dermal sutures, and the rest of the wound is completely closed with catgut and silkworm suture. No drains are employed. Gauze dressing is applied over the upper part of the wound in order to support the pharynx. A large tracheotomy tube wrapped with bismuth-paste tape is inserted in order to cork the trachea, following MacKenty's suggestion. The dressing as a rule is not changed for from five to seven days. There is very little reaction following this operation when done in stages. The Rehfuss tube, used in the second stage, is usually removed in about two weeks.

Pharyngeal fistulas which require closure are very rare (Figs. 5, 6 and 7).

While the one-stage operation has given excellent results, a great deal of postoperative care, irrigation, and so forth, and frequent secondary clos-



Fig. 6. Patient eight days following laryngectomy. Note the tracheal opening and complete closure of the wound. The Rehfuss tube is seen in place.

ure of pharyngeal fistulas are required. Following the method employed at the clinic no drainage of any kind or irrigation is necessary, and the chance of pharyngeal fistulas is slight, as the skin is closed primarily. If not more than ten days elapse between the first operation and removal of the larynx, chances of primary union about the trachea are about equal to those following a one-stage operation. Except for a few days after the first stage of the operation, the patient is able to eat his usual full meals until the second stage. This is a distinct advantage, as the patient is in much better condition for laryngectomy than when it is necessary to feed him through a Rehfuss tube for about two weeks previous to the second stage.

The operative mortality in these cases is very low. Last year major operations were performed in thirteen cases, laryngectomy in ten, and thyrotomy and excision in three, with no deaths. There have been few recurrences either following thyrotomy and excision or laryngectomy for intrinsic cancer. These patients are not the derelicts that they are frequently thought to be. The patients who undergo thyrotomy and excision practically regain their normal voices. The patients who must submit to laryngectomy, by the use of buccal speech or by the aid of the Western Electric voice-box are able to make a good living, and are quite happy.

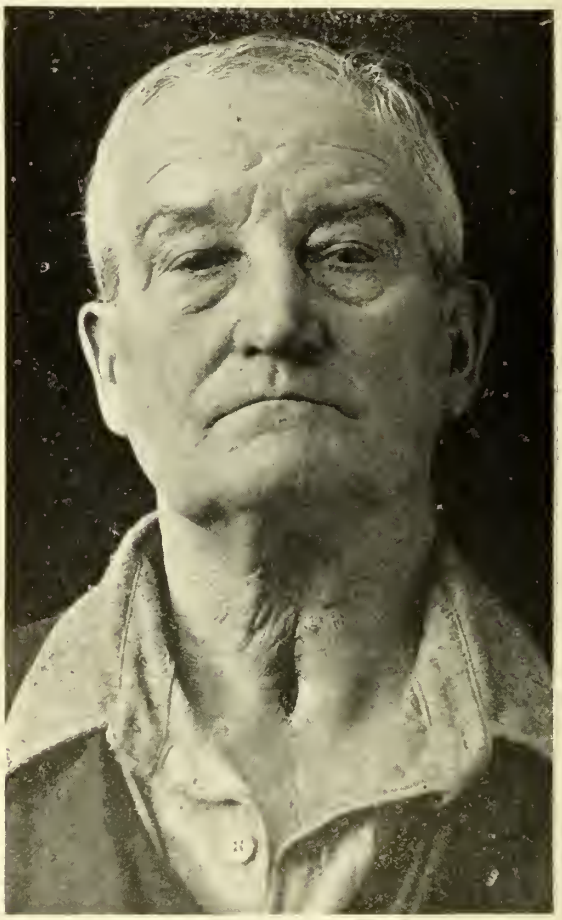


Fig. 7. Same patient as in Figure 6, two weeks later.

BIBLIOGRAPHY

1. Dinsmore, R.: Personal communication.
2. MacKenty, J. E.: Cancer of the larynx. Arch. Otolaryngol., 1926, iii, 205-232.

GOITER SURGERY; SERIES OF CONSECUTIVE THYROIDECTOMIES*

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The reduction of mortality in surgery of the thyroid gland is one of the noteworthy achievements in the long record of surgical progress. Today, operative procedures for goiter, judiciously and carefully carried out, appear to be even less serious than most other operations of major proportions. The dreadful fear of patients in former years that goiter operations were almost always fatal has now to a large extent been supplanted by the knowledge that these procedures are very safe, and that the end-results are satisfactory.

It is interesting to review briefly the course of progress in goiter surgery. According to Halsted,[1] probably the first operation actually performed on the thyroid was in the year 1596, "when an empiric attempted to remove a goiter in the case of a ten-year-old girl. She died under the operation and the surgeon was imprisoned." In 1791 Desault[1] performed the operation in at least two instances. In one case "after beginning the operation the hemorrhage was so severe that he abandoned the attempt and contented himself with tying the piece of gland which had been cut. The patient died suddenly of convulsions." In the second case he performed the operation "with the assistance of two people whom he came across accidentally. The patient died from hemorrhage on the operating table." At the end of the eighteenth century the operation was emphatically condemned in France.

The mortality up to 1850 amounted to 41 per cent, but had fallen to 21.2 per cent for 146 cases operated upon between 1850 and 1877. Reference to Halsted's tables shows that up to 1877 there had been in America thirty operations with five deaths; in England, thirty-nine with nine deaths, and in France, thirty with ten deaths. With the introduction of antisepsis a new courage was born and greater advance was made from 1873 to 1883. In this eventful decade Kocher had performed 101 goiter extirpations with a mortality of 12.8 per cent. From that time to 1907 the mortality had dropped to about 3 per cent, when C. H. Mayo[2] reported a total of 300 goiter operations with eleven deaths. In May, 1925, Pemberton[3] reported 1,928 operations on the thyroid with a mortality by operation of 0.51 per cent. At the present time the operative mortality in goiters not associated with hyperthyroidism is zero, while in the cases of exophthalmic goiter and adenomata with hyperthyroidism the mortality approximates 1 per cent. This low operative mortality is indeed a glorious tribute to those whose efforts have made possible this achievement.

Through unwarranted fear of goiter operations there is still a certain proportion of patients with hyperthyroidism, either of exophthalmic or of adenomatous type, who elect prolonged trials with one or another of the various types of less radical treatment. Probably most of this group eventually come to operation, usually much the worse off for the delay, and they present not only a higher operative risk, but also a lesser prospect of complete cure by operation than those who receive proper surgical treatment early in the course of the disease. There is also still an unfortunate reluctance on the part of many physicians in private practice to appraise fairly the relative and actual values of the various types of treatment. As a result, many patients, temporizing with ultra-conservative measures, becoming discouraged over their failure to improve, disheartened over relapses, and restless under the worry and strain of economic loss, are prompted to seek help elsewhere. Many of these fall easy prey to the guaranteed cures of the charlatan; and their last state is worse than the first.

On the other hand, it is equally discrediting that many wholly unnecessary operations are performed on the thyroid gland, operations that not only fail to relieve the symptoms erroneously attributed to the thyroid, but that actually aggravate them. How fortunate, perhaps, as Foss points out, that the adrenal and pituitary glands are not as readily accessible as the thyroid. It is certainly essential that the goiter surgeon possess not only a safe operative technic, but also a fine judgment in the recognition and interpretation of the signs, symptoms and laboratory data in any case of thyroid disease, together with a scrupulous observance of the indications for operation.

The diseases of the thyroid which may be treated surgically are grouped under the following headings: (1) Diffuse colloid goiter; (2) adenoma-

*Read before the Minneapolis Surgical Society, February 4, 1926.

tous goiter without hyperthyroidism; (3) adenomatous goiter with hyperthyroidism; (4) exophthalmic goiter; (5) thyroiditis; (6) malignancy. Accuracy in the differential diagnosis in these conditions is of great importance, for the method of approach in treatment varies somewhat with the different types. The above clinical classification, developed by Plummer, is a practical one and is quite generally accepted. Blanket diagnoses such as "hyperthyroidism," "toxic goiter," "cystic goiter," etc., are obviously ambiguous and dangerous. Careful palpation will in most cases reveal the size, shape, mobility and consistency of the gland, and the presence or absence of adenomata. Symptoms and signs due to dysfunction of the thyroid are quite readily recognizable clinically, and can be checked with precision by accurate determinations of the basal metabolic rate. Errors in diagnosis with consequent errors in treatment are often attended with serious results. Many of these mistakes can be traced to inaccurate basal metabolism tests, or to unwise reliance on a single test as the criterion of operability in a given case. Through the widespread distribution and the inexpert use of calorimeters the metabolism tests have suffered an appreciable abuse, and it appears more recently that Lugol's solution may not entirely escape this same penalty of sudden popularity.

Diffuse colloid goiter in general is not a surgical condition. Only in instances of extreme enlargement, or of marked pressure symptoms, in which medical treatment has proven ineffective, is operation justifiable. The administration of iodin in prophylaxis, and of desiccated thyroid or thyroxin in the treatment of colloid goiter is well established, and is effective in varying degrees in patients under twenty years of age. The results in patients over twenty are less satisfactory. From the surgical aspect there are two important points regarding colloid goiters. First, they are often mistakenly diagnosed as mild exophthalmic goiters. Second, the basal metabolism in colloid goiter is usually normal or below normal. The confusion of these simple goiters with exophthalmic goiter occurs most often in the patients who, by coincidence, manifest signs and symptoms of nervous instability. Proper evaluation of these symptoms and signs is extremely important, for, if subjected to operation, patients in this group will have disappointing results, and will only add disrepute to goiter surgery. Many patients with colloid goiters present evidence of focal infections, particularly tonsillar or sinus infections. Such foci should be eliminated before medical treatment is instituted. The presence of adenomata in a colloid goiter necessarily requires caution if iodin therapy is employed. Frequently, small adenomata become palpable in a colloid goiter only after reduction of the colloid portion of the gland has occurred. There should be no operative deaths in cases of diffuse colloid goiter, or in adenomatous goiters without hyperthyroidism.

Operations upon adenomatous goiters with hyperthyroidism, if performed before advanced degenerative changes have occurred, are attended with little or no risk. However, it is characteristic of patients in this group to defer operation as long as possible in the hope that it may never be necessary. Many of them follow all too faithfully the dangerous advice that they should not bother about the goiter until it bothers them. Unfortunately, by the time symptoms become bothersome many of these patients have become cardiopathic and are not greatly benefited by medical measures preparatory to operation. Furthermore, the degree of improvement attained after operation in these cases is relatively limited. Technical operative difficulties are often added in this group by substernal or retrotracheal adenomata, displacement of the trachea, and by abnormal locations of the recurrent laryngeal nerves. The operative mortality in adenomatous goiters with hyperthyroidism is now slightly higher than that of exophthalmic goiter. It appears that any further reduction of mortality in this group must come about through co-operation of the patients and physicians in securing early operations.

The important position of surgery in the treatment of exophthalmic goiter is fully justified by the results obtainable with proper surgical management. The actual operation itself should be regarded as merely one step in the entire procedure, and should never be undertaken as an emergency procedure. Up to three years ago successive advances in the treatment of exophthalmic goiter had lowered the operative mortality to about 3 per cent. This reduction was brought about through combined medical and surgical attacks under the leadership of Kocher, Billroth, Mickulicz, Halsted, C. H. Mayo, Plummer, Crile, and, more recently,

Pemberton. But notwithstanding the development of improved methods of anesthesia, general pre-operative measures, perfection of operating technic, and the employment of graded operative procedures, there still remained uncontrolled the dangers of acute post-operative hyperthyroidism, the most frequent cause of death following operative procedures for exophthalmic goiter. Since 1922 this last operative hazard has been overcome through the development by Plummer[4] of a successful method for the prevention and control of the "crises" of hyperthyroidism. He has demonstrated the tremendous value of the Compound Tincture of Iodin (Lugol's Solution) properly administered during the preparatory and post-operative stages in exophthalmic goiter, making possible a further striking reduction in the mortality.

The dangers of indiscriminate usage are ever attendant on any valuable addition to therapy. Iodin in exophthalmic goiter is not curative, and should be employed only as a vehicle to carry patients safely through the operative procedure, or to tide them through spontaneous crises. The striking clinical effect of iodin is the prompt abatement of the nervous symptoms and the disappearance of the stare peculiar to this disease. Decrease in the pulse rate and metabolic rate occurs in varying degrees, and there is usually a gain in weight and in strength. The general improvement is usually so marked that the majority of these patients are in the course of a week or ten days brought into the safety zone for primary thyroidectomy. In a small percentage, however, preliminary ligations are indicated. The administration of iodin in cases of non-toxic adenomata carries with it the possibility of the induction of hyperthyroidism. Its effect on adenomata with hyperthyroidism has not yet been definitely determined. It is well to remember that the use of iodin in exophthalmic goiter does not warrant abandonment of other valuable measures in pre-operative management.

Thyroiditis occurs rather infrequently, and may develop with gradual onset in an otherwise normal gland. It may occur in a colloid gland or in one containing adenomata. The gland becomes somewhat firm in consistency and is often associated with pain and tenderness. Frequently, there is a mild degree of hyperthyroidism with accompanying symptoms which will disappear if the process goes on to extensive destruction of the gland. Surgical drainage is indicated if localized suppuration occurs.

The early diagnosis of malignancy of the thyroid is difficult, but this condition should be suspected in any unusually firm adenomatous goiter of the thyroid, particularly in patients in the fifth decade. According to Herbst,[5] who has made an extensive review of this subject, the highest degree of malignancy in the thyroid is in sarcoma, and the lowest degree in papilloma. The incidence of malignancy in the thyroid is about 1 per cent, and approximately 95 per cent are carcinomata. Treatment by surgery alone is satisfactory only in the cases not far enough advanced for clinical diagnosis. In the advanced cases surgery in conjunction with radium will often bring about marked palliation and occasionally an apparent cure.

The fundamental technical principles in the operation of subtotal thyroidectomy may be grouped as follows: (1) Accurate control of bleeding; (2) avoidance of infection; (3) avoidance of injury to adjacent structures; (4) conservation of a sufficient amount of gland tissue; (5) thorough exploration for, and removal of, adenomata.

In the following tables are presented the major data from my first fifty consecutive thyroidectomies.

I. SERIES OF THYROIDECTOMIES

Number of Cases	50
Types of Goiter:	
Colloid	4
Adenomata without Hyperthyroidism	30
Adenomata with Hyperthyroidism	7
Exophthalmic Goiter	9
Sex:	
Females	42
Males	8
Age:	
Youngest (Exophthalmic goiter)	12 years
Oldest (Toxic adenomata, Myocardial degeneration)	66 years
Operation Previously Elsewhere (Goiter)	5 cases
B.M.R.:	
Adenomata with Hyperthyroidism (average)	plus 32
Exophthalmic Goiter (average)	plus 36
Ligations:	
Preliminary to Thyroidectomy (Exoph. G)	4 cases

II. OPERATIVE DATA

Anesthesia	Cases
Novocain 1% (infiltration)	30
Combined (Novocain and Nitrous Oxide)	13
Ethylene-Oxygen	7
(Two patients with local anesthesia had natural sleep during operation)	
Pre-operative Narcotic:	
Non-toxic Goiters, Morph. Sulph. ¼ and Atropine 1/150	
Toxic Goiters, Morph. Sulph. ¼ or 1/6 only	
Accident During Operation:	
Unsuccessful Ligation of Lateral Vein	1
Injury to Recurrent Laryngeal Nerve	1
Excessive Primary Hemorrhage	none
Injury to Trachea	none
Post-operative Reaction:	
Severe in Exoph. Goiter	1 case
Post-operative Complications:	
Secondary Hemorrhage	1 case
Obstructive Dyspnea Due to Nerve Injury	1 case
Wound:	
Infection	none
Hematoma (Sub-cutaneous)	1 case
Scar (Hypertrophic)	5 cases
Post-operative Time in Bed (Average)	2.6 days
Post-operative Time in Hospital (Average)	6.6 days
Operative Deaths	none

The highest operative risks in this series were four cases of long standing adenomatous goiters with hyperthyroidism and advanced myocardial degeneration with auricular fibrillation. All four were over sixty years of age. Two of these patients died about eleven months following operation,—one from cerebral thrombosis, the other with cardio-renal insufficiency. In both instances there had been marked temporary improvement during the first few months following operation. Of the other two patients, one has been completely restored to health and has a return to normal cardiac rhythm; the other has had definite general improvement, but is still fibrillating and is able to maintain only a narrow margin of compensation. The one patient with severe reaction following thyroidectomy for exophthalmic goiter had not received iodin treatment prior to operation.

Since the completion of this series, ethylene oxygen anesthesia has been employed except in a few instances. Post-operative reactions have been very slight and up to date no operative death has occurred following subtotal thyroidectomy.

REFERENCES

1. Halsted, W. S.: The operative story of goiter. Johns Hopkins Hosp. Rep., 1920, 19:72-258.
2. Herbst, Wm. P.: Abstracted in collected papers—Mayo Clinic, 1923, XV:606.
3. Mayo, C. H.: Collected papers—Mayo Clinic, 1905-1909.
4. Pemberton, J. DeJ.: Jour. Am. Med. Assn., 1925, 85:1882-1886.
5. Plummer, H. S., and Boothby, W. M.: The value of iodin in exophthalmic goiter. Jour. Iowa Med. Soc., Feb., 1924, 14:66-73.

UNWARRANTED THERAPEUTIC HOPES

Although drastic restrictions in diet no longer characterizes the management of diabetes, the problem of suitable foods for diabetic patients still looms large. Side by side with the exclusion of foods that promote either glycosuria or ketosis or both, has occurred the search for palatable energy-yielding food substances that will enrich the dietary of the diabetic patient without giving rise to untoward consequences. The proposal for the use of intarvin (glyceryl margarate) represented an attempt to furnish a fat not likely to promote ketosis in its metabolism. There have been varied efforts to discover derivatives of the sugars that will not escape oxidative destruction as ordinary carbohydrates do in the diabetic organism. The polysaccharide carbohydrate inulin has been recommended in the past for patients with diabetes, but it is possible that the apparent tolerance of the diabetic patients for inulin-bearing foods may be due to actual failure of digestion and absorption of this carbohydrate. In Germany the anhydrosugar glucosane and its polymer, tetraglucosane, have been used in the dietary treatment of diabetes, but recent investigation has shown that large quantities of ingested tetraglucosane are excreted unchanged in the feces. (Jour. A. M. A., May 22, 1926, p. 1626.)

FREAK MEDICAL PATENTS

The United States Patent Office is apparently unaware that there is such a thing as modern medical knowledge. Patents have been issued for bizarre products and devices of a medical or medicinal nature. These include Perkins tractors, Sanche's Oxygonor, the tapeworm trap of Meyers, the "consumption cure" of Serghison and several others. A patent was issued in March, 1921, to Mary McGuire Wilson for the "Process of and Material for Reducing Fatty Tissue." According to the patent specifications, the Wilson formula for reducing weight is alum, 12 ounces; camphor, 2 ounces; alcohol, 12 fluidounces; and witch hazel, 32 fluidounces. This mixture—which the Patent Office considers a new and useful invention—is to be applied to the skin of the "stylish stout" immediately following a hot tub. The stuff is then "whipped or spanked with the fingers to drive the solution into the pores." (Jour. A. M. A., May 29, 1926, p. 1701.)

TREATMENT OF HAND INFECTIONS AND INJURIES*

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It is impossible, in the short time allotted me, to present the treatment of individual conditions involved in infections and injuries of the hand. My intention, therefore, is to outline a plan of procedure, which has, in our Clinic, met with better than the usual results.

Nearly all hand infections are the result of injury, and the first thought in injury is the prevention of infection, while the paramount issue in either case is to conserve tissue and retain the best possible function. These cases are usually first seen by the general practitioner, whose early proper treatment will furnish a much better functional result than the later reconstruction of the surgical specialist.

The hand presents, in a small cubical area, a wonderfully smooth working, complex mechanical arrangement. In this short discussion we are unable to consider its anatomy, or to enumerate symptoms of differential diagnosis. An accurate anatomical knowledge, however, is imperative, that efficient treatment may be instituted and incisions or repair so made as to produce the least anatomic and functional disturbance.

You have all seen far too many patients who have presented themselves with a badly swollen, infected hand as the result of home treatment or neglect in an effort to avoid the painful surgical intervention that past experience has taught them to fear. By our own handiwork, then, we are instrumental in delaying that early treatment to which these patients are entitled. Likewise, such poor psychic results may cause a patient to judge with prejudice any unfavorable outcome of our efforts, and make him excellent timber for the malpractice lawyer. I feel that this phase is worthy of consideration, since patient and jury alike think themselves more competent to judge the results that should have been obtained in treating a hand, than in almost any other disability.

Let us first consider our method of procedure in those cases which do not need immediate penetration of the skin, though they may or may not later require such incision. We place the involved hand under a radiant light lamp for thirty minutes, giving as much heat as can be tolerated. If there is sufficient pain, so that this symptom enters into consideration, we employ the infra-red generator instead of the high-wattage bulb. This will greatly, if not entirely, relieve the pain in every case. Immediately following this, we expose the hand to a quartz light burner for a third degree erythema dose. By this method we obtain an increase in the leucocytes and create an active arterial hyperemia which is prolonged by the counter-irritation of the quartz light. We can produce greater counter-irritation with ultra-violet radiation, and still have no destruction of tissue, than with any other agent. Should there be much round-cell infiltration in the skin and subcutaneous tissues, we add to the above treatment the exposure of the part to a half skin unit of *x*-ray, without filtration or at times using one mm. of aluminum. The fingers and hand are then covered with light, loose, dry dressings, maintaining the best position of function. The arm is placed at rest, somewhat elevated, in a support. The patient is advised to expose the hand several times daily for periods of thirty minutes to an hour, to an electric heater, an electric light bulb or the open range oven. If these are not available they may use hot water bags. When there is systemic toxemia, hospitalization is advised where the hand and arm can be placed under electric bakers for periods of an hour, three or four times daily. It is needless to add that energetic systemic elimination is also instituted.

When these patients are examined the next day, we find that the progress of the infection has been arrested, and in many cases nearly cleared up. Much induration has been largely reabsorbed, leaving, at times, only a localized central area of suppuration, which can easily be incised and drained. Occasionally some additional exposures to radiant light and ultra-violet are necessary. We seldom employ wet dressings before incision of the skin, as they produce maceration with susceptibility to spread of infection should drainage become necessary. Then, too, it favors round-cell infiltration, which means more fibrosis with resultant loss of function or delayed recovery. On the unbroken skin, practically the only function of a wet dressing is the heat, and you all know that the skin tolerates far more dry heat than moist. By protecting an arm with layers of Turkish toweling, and plac-

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May, 1926.

ing it in a hot air baker, I have been able to elevate the temperature to 350 degrees F. without producing a burn. It is needless to explain what would happen at that temperature with moist heat.

As soon as we encounter that type of case which requires invasion below the surface, we have the element of pain to consider and must aim to minimize it. All too often no thought is given to the proper control of pain, possibly because general anesthesia is usually unwarranted for these minor conditions and in addition does not adapt itself to office procedure, while the infiltration of inflamed tissue with a local anesthetic is very painful and the result unsatisfactory. Consequently, hurried, ill-placed incisions are made, which are entirely inadequate to evacuate the pus or do not reach it at all.

The simplest conditions are lacerated wounds from injury, and require, usually, only surgical cleansing. The routine, early application of Tr. Iodine to injuries has been proven, by industrial surgeons, an excellent prophylactic against infections, but this cannot be administered without some pain. Under no circumstances should the wound be cleansed with soap and water, bichloride solutions or peroxide of hydrogen, as this only serves to distribute the infection. Our practice is to fill the wound with a 2 per cent solution of mercurochrome, which is painless, and then expose the part to a second degree erythema with quartz light. Mercurochrome, in addition to being an efficient germicide, is a photosensitive dye and conveys the ultra-violet radiation to every part of the wound with beneficial reaction.

In deeper wounds, where it is necessary to thoroughly cleanse them and insert sutures, we sprinkle a little flake cocaine over the raw surface, while preparing our instruments. In ten minutes we have a superficial anesthesia, which is sufficient for painlessly applying Tr. Iodine or cleansing a superficial wound. This is of especial value in handling children. With this superficial anesthesia and disinfection, we can proceed to anesthetize the margins and subcutaneous tissues of the wound with a little 2 per cent novocaine, using a fine hypodermic needle. This gives us an anesthetic field, painlessly obtained, in which to perform the necessary surgical procedure.

For incising infections or treating injuries of a finger, we can, without pain, by carefully starting with an intradermal wheal on the dorsum at either side of the base, proceed to block the nerves which run along both sides of the finger nearer the flexor surface. Never inject the solution from the palmar side, as the thick skin makes the use of even a fine needle more difficult and painful. It is necessary to keep well away from the inflammatory area, and should this extend to the base, we go up into the hand and block the nerve supply. In either instance it requires only a small amount of 2 per cent novocaine and after a wait of about fifteen minutes the finger is entirely anesthetized, be it ever so swollen and tender, and we can proceed with careful, thorough incision or repair. Where conditions involve the hand proper, nerve block anesthesia can readily be performed at a point two inches above the wrist. You can appreciate the value of this type of anesthetic, likewise, in the removal of some foreign bodies, when, if necessary, the patient can go to the *x*-ray room and manipulate his hand under the fluoroscope at the direction of the surgeon. If there is a possibility of pus being present in any area where you wish to do a regional block, it is better to use nitrous oxide anesthesia than run the risk of infecting other tissues by passing a needle through infected material.

Certain points regarding the incision of infected hands are of sufficient importance to bear mention at this time.

1. The practice of making unnecesary or prophylactic incisions to relieve pressure must be condemned.

2. Pus is not always present at the site of the greatest swelling, so we must differentiate between edema and induration. The point of most pain is the best indicator of the position of the pus.

3. Do not incise the distal phalanx along the palmar surface or crucially across the end, as the resultant scar will be tender and interfere with the tactile sense. Should it be necessary to make an incision on the flexor surface, do not extend it beyond the first flexion crease of the finger for fear of infecting the tendon sheath. Make your incisions along the side, where they can be lengthened and carried down to the bone if needed.

4. Generally in hand infections the loose skin on the dorsum will be more swollen than that of the palm. The majority of all cases, however, have the pus under the flexor surface.

5. The early recognition of teno-synovitis is imperative, so that prompt incision of the tendon sheath may be made, and the best possible function preserved.

6. Incisions must be ample to provide free drainage. They should be made in the long axis of the hand to avoid tendons and nerves. In palmar space infections make the incisions in the interdigital web and, as a rule, do not extend them beyond the first flexion crease.

I wish to call attention here to the pernicious habit of expressing infected material or "squeezing a boil," which many cannot resist doing. This is disastrous, as it only serves to spread the infection throughout the subcutaneous tissues. There is a simple method, however, whereby we can assist evacuation of the pus and debris. By placing the ball of each thumb on opposites sides of the incision, well away from the area of induration, we pull the edges apart. The pressure necessary to accomplish this is transmitted, through the lever action of the indurated tissue, as expulsive force to the base of the abscess, while at the same time holding the wound apart. This method is also painless, since our manipulation is beyond the inflamed area.

As drains, after incision, we usually employ strips of gauze which have been sterilized in equal parts solid and liquid petrolatum with 1 per cent phenol added. This dressing encourages drainage, since the meshes cannot fill with pus and debris nor adhere to the sides of the wound and act as a plug. Its removal, therefore, is quite painless. It should not be used in a wound with much free bleeding, but can be inserted after a few hours' preliminary packing with ordinary sterile gauze to favor clotting.

For wet dressings we employ a 5 per cent sterile sodium chloride solution. This, being a hypertonic saline, creates a liberal flow of serum from the tissues, which assists materially in flushing out the septic material. If there is much necrosis, Dakin's solution is substituted for a short time, except where we have necrotic tendons, as here it produces more necrosis and sloughing. In hospital cases, to keep the dressings constantly warm we employ electric bakers or incandescent bulbs protected by wire cages. This is much superior to the varying temperature of hot water bags. Moist dressings are usually continued for only two or three days, as they favor production of granulation tissue and produce more round-cell infiltration with resultant fibrosis. All drains are usually removed after twenty-four to forty-eight hours. We find that the period of drainage is shorter and convalescence hurried if we early remove all drains and discontinue wet dressings. We employ in their stead exposures to electric bakers or radiant light for thirty minutes to an hour several times a day, with an application of quartz light to produce second degree erythema daily or on alternate days. Between treatments the hand is simply covered with light dry dressings.

Immobilization is a very important factor in the treatment of these hand conditions. Ordinarily, the tendency is to fix the hand on some rigid support with the fingers straight or place a single finger on a wooden tongue blade. This is absolutely wrong, except in the one instance where we may have prolapse of exposed tendons with the finger flexed. Otherwise, we immobilize in the position of function, that is, with the hand tilted slightly backward, and the fingers flexed in a half clenched position, so that normally they could be touched by the tip of the thumb. Then, even though much fixation and impaired motion follow, we still have a fairly useful hand.

In any plastic or reconstruction surgery of the hand, especially of the flexor surface, infection may ensue because of the difficulty of disinfecting the thick calloused skin. We have found material help in preventing this by giving, two or three days preceding operation, a second degree erythema with quartz light and repeating it the next day. Following operation we expose the hand to the infra-red generator two or three times daily, as this relieves pain and produces an active hyperemia which both hastens recovery and aids function. As soon as we can feel assured that no infection is present in the hand or fingers, either following operation or after free incision and drainage, we employ diathermy daily. The tips of the fingers are placed in saline for one electrode with a cuff above the wrist as the other. The current is gradually increased to 400 or 600 ma. and maintained for thirty minutes. This will hasten absorption of fibrous exudates and gives earlier and better function. To supplement this, as early as possible, we employ gentle manipulation together with applications of the galvanic sine wave current.

By the systematic employment of these methods, we are satisfied that we have instituted a type of treatment which gives us the minimum of pain, the most rapid recovery, and the least disability with the best functional result.

TRAUMATIC SPONDYLOLISTHESIS*

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Spondylolisthesis, or forward dislocation of the fifth lumbar vertebra, is described only briefly in modern text books, if at all. It is said to be a rare condition occurring chiefly in women after parturition. The appearance of five cases in my practice during the past year, all adult males, leads me to believe that the condition is perhaps not so rare as the literature indicates, and that possibly some of these cases, resulting from trauma, are being overlooked.

Due to the traumata of modern industry, spondylolisthesis is nowadays more frequent in men than in women. The importance of good *x*-rays, both antero-posterior and lateral views, in every case of back injury has often been mentioned. This dictum, however, cannot be repeated too often, and it should include lateral *x*-rays of the fifth lumbar vertebra.

The surprisingly small amount of initial disability in these cases is deceiving. The patients soon return to their work, and continue for a time, but complain of weakness and pains in the lower back and legs. The dislocation is a slowly progressive process, however, and as it progresses the symptoms increase in severity until finally the patient can work no longer.

Spondylolisthesis (not lithiasis) should be considered upon finding four cardinal signs:

1. A prominent, vertically placed, sacrum.
2. A palpable, visible, "hollow" just above the sacrum.
3. A sharp lordosis of the lower lumbar spine.
4. Limitation of extension in the lumbar spine.

Kleinberg[1] has clearly described the roentgenogram. The antero-posterior view shows the vertebral canal of the fifth lumbar, with its lamina *above*, transverse processes pointing slightly upward, and its body superimposed on the upper sacrum. A good lateral view is diagnostic. The illustrations herewith are stipple tracings of *x*-ray films. These are used because it is extremely difficult to reproduce the *x*-rays, much of the detail being lost in printing. In heavy individuals the relation of the fifth lumbar to the tip of the sacrum is often hard to demonstrate because the rays must pass through both iliac wings (compare Figs. 1 and 2).

The superior surface of the sacrum (the basis ossis sacri), according to Treves, or Goldthwait,[2] normally inclines downward and forward from the horizontal plane at an angle of thirty-five to forty-five degrees when the individual is in the erect position (see Fig. 3). There is a great deal of variation in the lumbo-sacral angle in normal individuals, as is well recognized, yet exaggerated lordosis with extreme downward and forward inclination of the sacrum is a potentially weak back. The fifth lumbar is prevented from forward dislocation solely by the articular processes of the sacrum, the ilio-lumbar ligaments, and the muscles. The latter, of course, exert poor mechanical action in this respect.



Fig. 1. Case 1. Spondylolisthesis. Ordinary x-ray print.

Whether spondylolisthesis is congenital, follows parturition, or is due to trauma, the skeletal anatomy must be the same, for obviously the fifth lumbar cannot slide forward unless the superior articular processes of the sacrum face superiorly, or directly mesially. It is often difficult to demonstrate the shape and position of these articular

*Read before the Hennepin County Medical Society, Minneapolis, September, 1925.

facets with the *x*-ray, yet good stereoscopic views often show them clearly. The position of these facets is extremely variable at the lumbo-sacral articulation. According to Spalteholtz they normally face mesially, but are slightly crescentic in both vertical and horizontal planes. Congenital cases show a congenital anomaly of these processes in that they usually face directly upward, as is the case in three of the traumatic cases here reported.

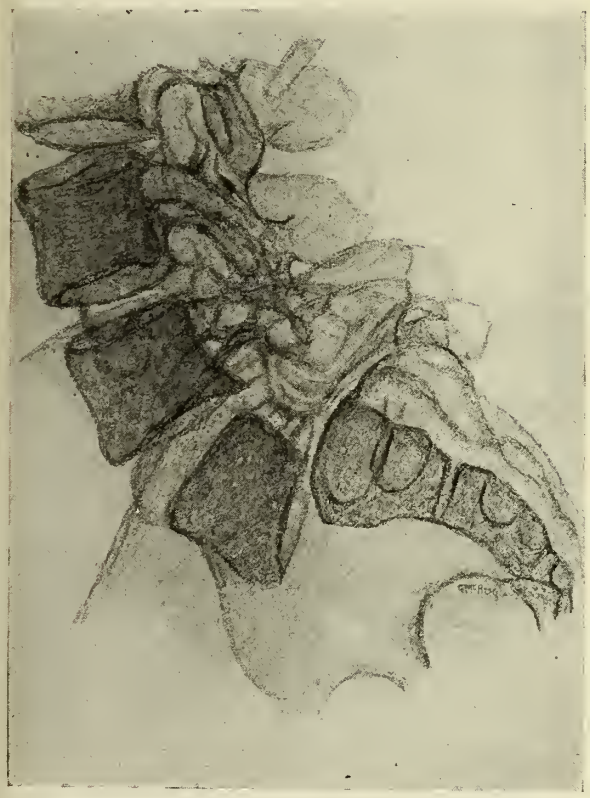


Fig. 2. Same as Figure 1. Stipple tracing.

In the normal spine the trauma presumably shears off the superior articular processes of the sacrum by fracture of their bases—a fracture of the spine by extension at the lumbo-sacral joints. Fractures of articular processes are extremely hard to prove, even with good stereoscopic roentgenograms. However, it is unlikely that a malformation existed prior to the injury and that the trauma simply strained the ilio-lumbar ligaments. If this were the case, symptoms would have appeared early in life—the congenital type—for ligaments do not withstand chronic pull.

The traumatic cases in this report are all adult males. They all date their symptoms back to a severe fall several years ago. The height varied from ten to twenty feet, but the landing in every case was the same, namely, in the sitting posture, *i.e.*, on the buttocks, with the spine erect. These men all returned to their duties within a few weeks of the accident but complained of back pain ever since their injuries. Though all were examined several times by physicians, lateral *x*-rays of the lumbo-sacral region had been made in only two cases. Their symptoms steadily increased in severity until, when I saw them, they were unable to do any work which required standing, stooping, or lifting. The antero-posterior *x*-rays are characteristic of spondylolisthesis in each case, and the lateral views clearly show the slipping. The antero-posterior views show the sacral articular facets facing upward in each case (see Figs. 4, 5, 6 and 7). None of these cases presented evidence of nerve involvement, which, as Goldthwait has shown, is a comparatively rare complication.

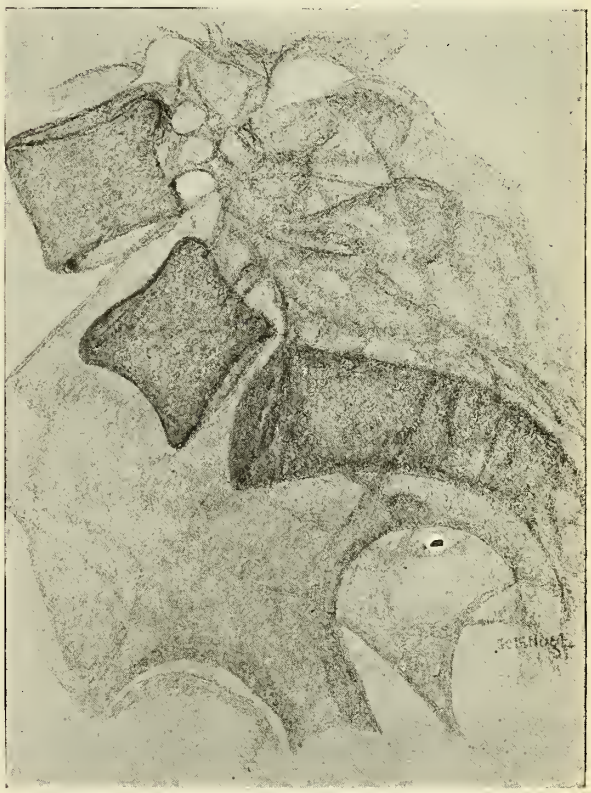


Fig. 3. Normal lumbo-sacral articulation.

In falling, the force of the spinal column, slightly extended at the lumbo-sacral joints, probably fractures the superior articular processes of the sacrum,—a shearing force as Von Lackum[3] has pointed out, producing a slight forward luxation of the fifth lumbar on the sacrum. Gradually the



Fig. 4. Case 2. Antero-posterior view. Note spinous process of the fifth lumbar pointing upward, the body of the fifth superimposed upon the shadow of the sacrum, the transverse processes of the fifth lumbar inclining upward, and the oval of the vertebral foramen, seen from below.

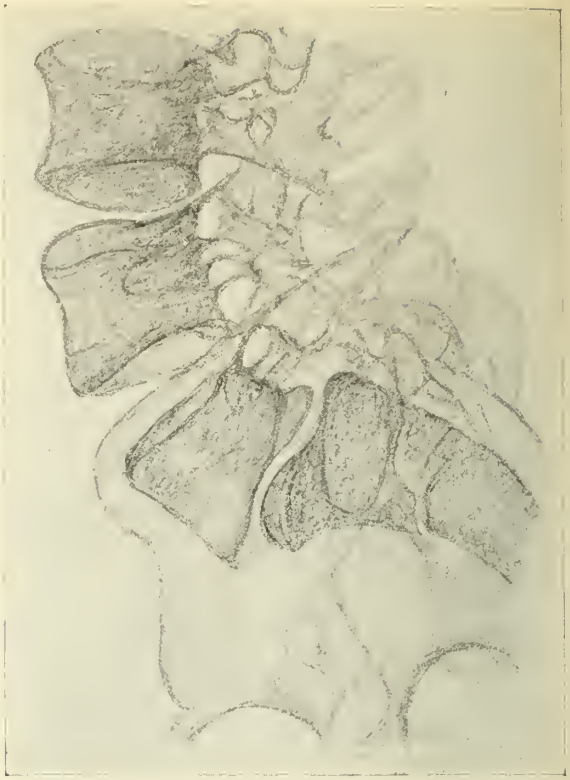


Fig. 5. Lateral view of the same case as Figure 4.



Fig. 6. Case 3.



Fig 7. Case 4.

ilio-lumbar ligaments stretch, and the dislocation progresses, increasing the disability (see Figs. 8 and 9).

The diagnosis is easily made with the aid of good *x*-rays, but patients seek relief in addition to diagnosis. If an immediate diagnosis is made the question of the reduction of the dislocation occurs.



Fig. 8. Case 5. 1923.

There is no case on record where such a reduction has been accomplished. Goldthwait attempted a reduction by open operation and a great deal of traction was used, but reduction could not be obtained. If diagnosis could be made immediately after the injury, it seems to me that the dislocation, if present at that time, might be reduced. Often, however, the dislocation is not present immediately after the accident. It occurs gradually, later on, when the upright position is assumed.

Obviously a sacro-iliac belt, or the ordinary back brace, is of no value. The so-called "Osgood," or "butterfly" brace, may give some temporary relief. This brace carries the weight of the shoulders and thorax on the iliac crests by means of axillary crutches, but most patients cannot tolerate prolonged support by an axillary crutch.

A fusion operation, of the Hibbs type, offers the best hope for relief in these cases. However, when the dislocation is advanced it is extremely difficult to fuse such a spine. The laminæ are so deep in the operative field that they can scarcely be reached and ankylosis of the lateral articulations by curettement is no longer possible. The introduction of an Albee graft into the forward and tilted spinous process of the fifth lumbar is also difficult and offers little hope of success. An operation so extensive as the Hibbs fusion is not advisable in older men. Early diagnosis of fracture and dislocation, followed in a few weeks by a fusion operation, usually reduces the amount of disability. Three of these cases were operated fairly early with relief of symptoms to date. These men

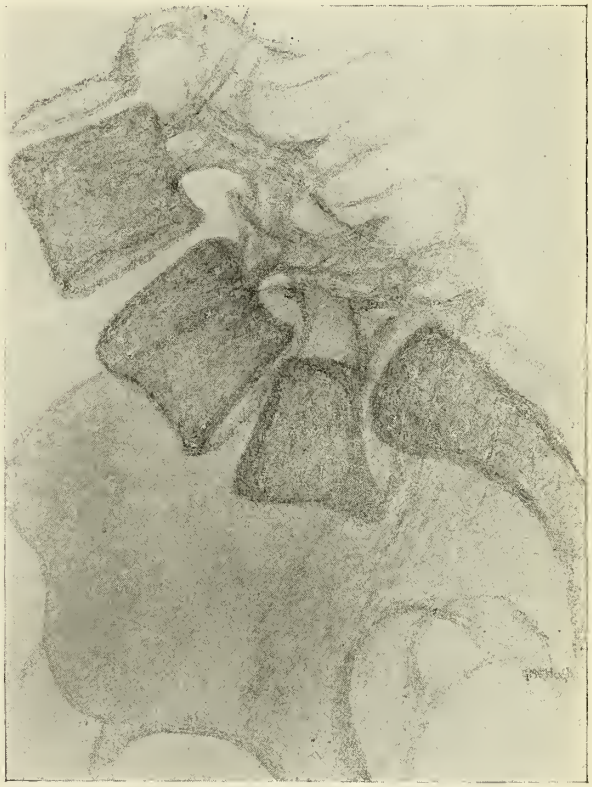


Fig. 9. Case 5. 1926. Note progressing dislocation and rounding off of the sacrum.

get along very well by avoiding heavy lifting, bending, and stooping, and they are well pleased with their results.

BIBLIOGRAPHY

1. Kleinberg: Arch. Surg., 1921, 3, 102.
   Kleinberg: Ann. Surg., 1923, 77, 490.
2. Goldthwait: Bost. Med. & Surg. Jour., March, 1911.
3. Von Lackum: Jour. Am. Med. Assn., 1924.
4. Fitch: Amer. Jour. Orth. Surg., 1913.
5. Darling: Roentgenology, 1918.

STRICTURE OF THE URETER*

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By stricture of the ureter I mean an inflammatory infiltration of the ureteral walls; starting in early congestion, passing on to inflammation and later fibrous infiltration with resultant narrowing of the ureteral lumen to a varying degree. The subject is a large one, and in the time allotted I will briefly consider what to me seems most essential at this time.

I have found ureteral strictures present in approximately 20 per cent of my urological cases. There is a great deal of controversy among urologists at present regarding the incidence of stricture of the ureter. Hunner[1] of Baltimore has done pioneer work on the subject and is, I believe, subjected to undue criticism for his enthusiasm. Prominent urologists,[2] however, all over the country are rapidly falling in line, many of whom were former antagonists of the stricture theory. I do not feel qualified to corroborate all of Hunner's opinions, but, on the other hand, I have clearly demonstrated ureteral stricture in a sufficient percentage of cases to justify presenting the subject. There will be much controversy yet to come, as there is in all disputed subjects, until the matter finally rests on a firm foundation and the pendulum swings to the happy medium. I can cite many instances of ureteral stricture responding beautifully to treatment where innumerable operations for appendix, gallbladder, stomach, pelvis, etc., seemed only to accentuate the symptoms complained of.

Classification.—Ureteral strictures are classified in two main groups, (1) congenital, and (2) acquired. Braasch believes congenital stricture so rare as to be almost a negligible factor and it is now understood that many cases formerly reported as congenital strictures were in reality due to acquired mechanical obstruction. It is the accepted view of those[3] who have done pioneer work in this subject that stricture of congenital origin occurs, although infrequently, and is differentiated with some difficulty from valve and other obstructions.

For convenience's sake, I will classify the acquired strictures etiologically into five main groups.

1. Blood-borne focal infection. The big majority fall in this group—tonsils, teeth, sinuses, skin, bone and gastro-intestinal tract. Symptoms of stricture are very frequently preceded by history of tonsillitis, sinusitis, bronchitis, influenza, dental trouble or gastro-intestinal complaint, and many cases of pyelitis or hydronephrosis are preceded by history of ureteral involvement, although this fact is frequently very difficult to elicit.
2. Tuberculous.
3. Gonococci with secondary invading organisms.
4. Extension.
   a. Appendicitis—a ureteritis causing blood and pus in the urine in relatively large amounts occurs with enough frequency from appendicitis that we must always be on our guard. I have many such cases.
   b. Pelvic abscesses.
   c. Uterine appendages in the female.
   d. Vesiculitis and prostatitis in the male, as has been carefully brought out by different observers.
5. Traumatic.
   a. Surgical—usually in operations on the uterus or adnexa.
   b. Childbirth injuries.
   c. Calculus.
   d. Direct injury.
   e. Radiation and malignancy.

Strictly speaking, traumatic stricture is not a narrowing due to disease, hence I only mention the usual causes and omit them from further discussion except the stricture following stone impaction. Strictures following surgical injuries or childbirth are frequently complicated by necrosis and sloughing and usually require surgical treatment. I also omit ureteral obstruction due to bands, vessels, kinks, spasm, etc., as they are cases of obstruction of a non-inflammatory type.

Pathology. — Reviewing briefly the anatomy of the ureter, we find that it is a fibro-muscular organ 28 to 30 cm. in length and 2 to 7 mm. in diameter externally and 1 to 6 mm. internally. Histologically, it has an outer fibrous coat in which run the larger blood vessels with outer and inner longitudinal muscles and middle circular muscle coat, surrounding the submucosa and mucosa, which latter is composed of transitional epithelium the same as the bladder and kidney, ideas to the contrary notwithstanding.

*Read before the Minnesota State Medical Association, St. Paul, May, 1926.

Pathological data on the ureter are somewhat lacking, but consensus of opinion is that in most cases infection starts in the outer fibrous layer and gradually spreads, involving all the coats. Hunner[4] states that, unfortunately, if the lesion be properly treated urologically it will offer few opportunities for study by the pathologist; but, on the other hand, if the cases are neglected in their incipiency, destructive kidney lesions such as hydro- or pyonephrosis, lithiasis, etc., then the damaging effects of the secondary pathological changes will obscure the primary causative condition.

As to localization, the areas having the richest blood and lymphatic connections are most frequently affected: (1) the broad ligament areas, (2) the bifurcation of the iliacs and (3) to a lesser extent the pelvi-ureteral junction. This speaks strongly in favor of focal infection.

Most cases of ureteral stricture show a bilateral involvement and not infrequently the symptomless side is the one most affected, hence, we always treat both sides.

Trigonitis is a usual accompaniment and two-thirds of the cases also show urethral involvement which necessitates urethral dilatation preceding cystoscopy, with further urethral treatment before the condition is cured.

Stirling[5] cites 1,000 autopsies where 20 per cent showed inflammation of the ureters and kidney pelvis, not recognized clinically. Kretschmer[3] and also Eisendrath[3] have made notable contributions to ureteral stricture pathology. On the other hand, there are several of the most prominent pathologists of the present day who maintain that they have failed to find pathological evidence of stricture of the ureter.

Proof of the pudding, however, should be in the eating and when multiple operated patients bordering on the neurasthenic class come back time after time for ureteral dilatation and finally pronounce themselves as cured and well, and remain so for years, I feel that ureteral stricture, which is in most cases responsive to treatment, is a definite clinical entity frequently overlooked by internists and surgeons and is not at present receiving the consideration it deserves.

Symptoms.—1. Pain is the foremost symptom. This is usually local, deep in back of Poupart's ligament, due to inflammatory reaction in the broad ligament or iliac gland region of the ureter. If the lesion is higher up the location of the pain usually corresponds. It is usually a dull, nagging discomfort, which is usually worse in the morning, with early morning dysuria, and aggravated at the menstrual period. In many of my cases, the pain has been localized just above the crest of the ilium. In the cases resulting from vesiculitis or pelvic inflammation, the pain is apt to be of a deep, boring perineal variety. Disabling pains of renal colic usually mean a secondary pyelitis or hydronephrosis and we find a number of our patients diagnosed as "Dietl's crisis" suffering primarily from stricture.

2. Backache is frequently present and is lower thoracic, upper, mid or lower lumbar or sacral and not infrequently referred to the sacro-iliac joint.

3. Bladder symptoms may be absent, but they are usually present, varying from a mild to a very severe degree, depending upon the involvement. Their characteristic, however, is that they seem to come as if "from a clear sky." They are usually preceded by a cold, sore throat, dental work, exposure, gastro-intestinal trouble, etc. The second characteristic of the bladder symptom is the intermittency—persisting until the condition is permanently cured. Hunner professes to find strictures in practically all of his eneuresis cases and most of his incontinence cases and to cure them by the proper ureteral dilatation and elimination of infection.

4. Gynecological symptoms. From the close relationship of the parts, it is not surprising that gynecological symptoms are prominent. "Ovarian neuralgia" and "falling of the womb" are frequent complaints. The aggravation of all symptoms during the menstrual period is explained by the swelling of the ureteral mucosa in an already narrowed ureteral lumen, and from this, we have the term "ureteral dysmenorrhea," which suggests careful urological examination of any patient with dysmenorrhea not relieved by dilatation, or in any patient showing no genital tract lesion, particularly if previous periods have been normal. Dysparenia from trigonitis and ureteritis is not infrequently noted.

5. Headache, at times of the migraine type, gastro-intestinal symptoms of nausea, vomiting, distension, rectal pressure and mucous colitis are sometimes prominent. Fever and chills, depending upon infection, may appear when occlusion is complete, which illustrates beautifully the infection

following urinary stasis which is promptly relieved on resumption of drainage.

Diagnosis.—1. History.

2. Physical examination with especial reference to areas of focal infection. Kidney, bladder and ureteral palpation for masses and particularly tender areas.

3. Urinalysis. Thirty per cent of the cases show a negative urine while 50 per cent show very little.

4. Urological examination should be made with especial reference to urethritis, trigonitis and cystitis, and should be followed by the wax or olive bulb bougie or catheters of different sizes and the pyelo-ureterogram. Hunner depends chiefly for his diagnosis upon the olive bulb and wax-tipped catheter, but his clientele is confined exclusively to women and he works through the Kelly cystoscope, while Braasch relies on the pyelo-ureterogram.

Using the olive bulb bougie or catheter, it is not difficult after a few trials to feel the "hang," as the olive engages in the stricture, the same as we would in a stricture of the urethra. A differential phenolsulphonephthalein or indigo carmin test or both are helpful in the diagnosis.

Wax bulbs are readily and quickly molded from sterile beeswax, and have much to recommend them in their ease and gentleness of manipulation with less reaction. I also like the Braasch style bulbs, especially for the male patients. The "hang" of the bulbs in these cases is definite. I grant that especially on entrance this can also be caused by spasm and certain other conditions, but we correlate our findings and add thereto the urogram, which should show dilatation above the stricture area. Here let me call attention (1) to the elasticity of the ureter and personal equation in interpretation of the films, and (2) to the early cases which show little or no dilatation on the urogram where the bulb tests are strongly positive and which respond beautifully to treatment. We must also remember that passage of a No. 6 catheter does not rule out ureteral stricture and this is particularly true between attacks, exactly as we find disappearance of rigidity and tenderness in the interval between cholecystitis or appendicitis attacks.

Expulsion time in these cases is important, the normal kidney pelvis emptying in 2 or 3 minutes as a rule. With stricture the time is frequently prolonged 15 to 20 minutes or longer.

I have used the various pyelographic media, but at present prefer the solution of 12 per cent sodium iodide with a 1-3000 mercuric iodide. This is only mildly irritant and in addition possesses a germicidal value of 5 per cent phenol and does not need boiling.

The technic of urography is now so established it needs no repetition.

Treatment.—1. Elimination of all foci of infection. This is important. Tonsillectomy, extraction of all dead teeth and elimination of any sinus, skin or bone infection. This much is agreed upon in practically all clinics as a routine procedure. Gastro-intestinal disorders must be remedied and pelvic infections in the male and female must be eradicated. Alkalies and urinary antiseptics are of some value—depending, however, upon the infecting organisms. I have found adequate drainage far superior to the routine antiseptic lavage. Sedatives and antispasmodics are more helpful.

Rest, fluids and heat therapy, especially hot Sitz baths and warm enemas are sufficient to apparently cure a number of the cases, but they flare up later on. So-called pyelitis of infancy cases usually fall in this class, but it is an established fact that these cases react much quicker and better following cystoscopy and dilatation.

2. Dilatation with plain or preferably the olive or wax bougie or catheter to a point insuring good renal drainage. This is best carried out about every ten to twenty days and while some of the patients respond nicely after two or three treatments, others require observation for very long periods of time. This treatment applies also to stricture following stone impaction or trauma unless complicated by surgical conditions as fistula or necrosis.

I use the ordinary ureteral catheters with different kinds of tips, of which the Blasucci with the long, soft tapering tip is frequently of great value; also, bougies, plain and with olives. In cases where it is impossible to insert a ureteral catheter or small bougie, I use the filiforms; but one must be especially careful with the whalebone filiforms so as not to puncture the ureter, as has been not infrequently done in different clinics. If this occurs, however, the important factor is to recognize it immediately.

The first dilatation is always painful and fol-

lowed by untoward reaction in direct proportion to the disease present and the trauma occasioned. This seems to be the rule in all clinics and apparently unavoidable. It is caused by reactionary congestion with resulting occlusion of the ureteral lumen. I usually dilate the worst side first with dilatation of the other side one to three days following, with repetition of treatment in ten to twenty days, depending upon the individual case. The number of dilatations necessary varies tremendously, as does the time needed for cure. A big majority of cases come in this class of treatment by dilatation.

In so-called pyelitis of pregnancy cases, we follow the same routine, but only sufficient to carry the patient safely through to labor. Very frequently, one ureteral dilatation is sufficient to give a very definite relief of symptoms. An interesting point in this connection is that reported by a pediatrician in Switzerland who lived in the same town over a long period of years where most of the people had intermarried and so stayed in the same community. He noted that a large proportion of the women who had had pyelitis in infancy had pyelitis of pregnancy later on.

3. After three or four dilatations, we can usually tell by a urological check-up of our patient whether or not surgery will be necessary.

Surgical treatment.—1. Strictures of the intramural portion of the ureter which do not respond to dilatation can be incised upwards for a distance of 2 cm. without harm, as the intramural portion of the ureter is at least 2.5 cm. in length.

2. Retrograde dilatation can be performed from above in certain cases where it is impossible to enter the ureter from the vesical route.

3. In view of the bilateral incidence in most of these conditions, nephrectomy is the operation of last resort; hence, we endeavor to do a fixation of the kidney with a plastic on the large hydronephrotic sac, eliminating the so-called water trap pelvis and valve action, thereby insuring better drainage.

The condition of both kidneys must always be carefully considered before undertaking treatment of any kind, more especially surgical treatment. Resection with reimplantation of the ureters is done in some cases.

4. Treatment of the tuberculous stricture consists chiefly in the advisability of nephrectomy, as taken up under "tuberculosis of the kidney."

CASE REPORTS

Case 1.—Female, aged 38. Following severe instrumental delivery seven years ago has had gradually increasing backache, pain in the right and left abdomen, with urinary irritation, worse at periods. She rolls around in bed with pain or sometimes walks the floor at night.

Examination showed dense strictures to 3 mm. bulbs. in the right and left lower ureters.

Nine treatments over six months' time has made her better than for five years and pelvic and appendiceal operations advised formerly are now utterly refused, as she is well.

Case 2.—Female, aged 62. Complaint—Pain in the left lower abdomen. Urinary frequency at intervals for 24 years.

Examination disclosed a urethral stricture necessitating dilatation, and a moderate stricture in the lower right ureter. Dilatation of the strictures and treatment of the infection caused prompt relief. In this case, the differential P.S.P. at the beginning of treatment was 20 per cent on the right and 5 per cent on the left in forty minutes, while the *x*-ray showed an unusually large, slightly hydronephrotic congenitally deformed pelvis on the left. After a series of treatments, the P.S.P. was very nearly equal and the patient was relieved over a period of eighteen months. At this time, a second series of treatments gave her definite and lasting relief to the present time.

Case 3.—Female, aged 18. Complaint — Pain in left lower abdomen, nausea, vomiting, anorexia and constipation—much worse during menses. Some frequency and dysuria of seven years' duration.

Examination shows stricture in the right and left broad ligament area with bilateral infected hydronephrosis and congenital reduplication of kidney pelvis on the left. Six dilatations gave prompt relief until an attack of influenza a year later caused a recurrence necessitating further treatment. Now well for four years.

Case 4.—Female, aged 62. Complaint is cramplike pain in the right abdomen with persistent dull ache, vomiting, food distress, frequency and dysuria. Has had appendix and gallbladder surgery without benefit.

Examination discloses infected hydronephrosis on the left; infected hydroureter and hydronephrosis on the right with stricture shown in passage of a No. 5 catheter and the 3 mm. bulb, 2 cm. above the vesical orifice.

Dilatation followed by market reaction. Patient improved but still under observation.

Case 5.—Female, aged 28. Complaint—Headache, backache, pain in the bladder, left abdomen and kidney; severe dysuria and frequency in spells.

Cystoscopy showed marked stricture of the left lower ureter and hydroureter with relief on repeated dilatations.

Case 6. — Female, aged 40. Complaint is pain in the right abdomen and back of eighteen years' duration. Seven months' pregnant. For five months she has had attacks of chills, vomiting, pain in the right abdomen and back, weakness, loss of weight and hematuria. She has been in bed for the last five months. The patient was in very poor condition but a cystoscopic examination was made which disclosed a moderate stricture of the left lower ureter and a marked stricture in the broad ligament portion on the

right, with hydronephrosis plus a hydroureter with tortuosity, kinking and probably valve action at the pelvi-ureteral junction. The left side shows a double ureter.

After two dilatations, this patient refused further treatments and went home with a bad prognosis. Improvement, however, was prompt and definite and the patient was soon up and about and later safely delivered. She is now stronger than for ten years. I expect to get further data on this case in the future.

I have recently treated five pregnancy cases associated with stricture—all in a very serious condition—reports of whom will be taken up later.

Case 7.—Male, aged 48. Complains of pain in the right lower abdomen of four weeks' duration, food distress, urinary urgency at times with difficulty on voiding. Comes for appendectomy.

Examination showed tender mass in right lower abdomen.

Cystoscopy showed very marked obstruction 3 cm. from the right ureteral orifice; absence of left ureteral ridge and orifice and no appearance of indigo-carmine from the left ureter.

A urogram showed a hydronephrosis affecting the pelvis and major and minor calyces and a hydroureter with marked dilatation just above the strictured area.

The patient gained four pounds and was much improved at the end of three weeks until a third dilatation has made him so well that he dislikes to take further treatments.

This is an unusual example of stricture occurring in ectopic single kidney.

CONCLUSIONS

1. Ureteral stricture is a definite clinical entity, is one of the most common intra-abdominal lesions and is frequently overlooked.

2. The symptom complex, while variable, is not difficult to diagnose.

3. Urinary findings are frequently negative, hence, valueless without a complete urological examination.

4. Many needless intra-abdominal operations are performed without thorough examination of the genital tract.

5. The progress is insidious and serious kidney destruction often results before the true condition is recognized so that numerous operations on so-called surgical kidneys can be avoided by conservative ureteral treatment.

6. The results achieved more than repay us for the efforts in diagnosis and treatment of this condition.

BIBLIOGRAPHY

1. Hunner, Guy L.: End-results in one hundred cases of ureteral stricture. Jour. Urology, Vol. XII, No. 4, Oct., 1924.
2. Rathbun, Nathaniel P.: The incidence of ureteral stricture. Jour. Urology, Vol. XIV, No. 4., Oct., 1925. Livermore, Geo. R.: Ureteral stricture. Jour. Urology, Vol. XV, No. 1, Jan., 1926.
3. Kretschmer, Herman L.: Congenital stricture of the ureter. Surg., Gyn. & Obst., Vol. XLI, No. 6, Dec., 1925.
   Eisendrath: Ibid.
4. Hunner, Guy L., and Wharton, Lawrence R.: The pathological findings in cases clinically diagnosed as ureteral stricture. Jour. Urology, Vol. XV, No. 1, Jan. 1926.
5. Stirling, Wm. C., Jr.: Pyelonephritis. Jour. Urology, Vol. IX, No. 1, Jan., 1923.

KOCH'S "CANCER ANTITOXIN"

In 1918, Wm. S. Koch was graduated in medicine. Less than a year after his graduation in medicine, Dr. Koch announced that he had "developed a real specific cure for cancer." Seven years have passed during which Dr. Koch has seen fit to keep the composition of his preparation to himself. During that time The Journal of the American Medical Association has been unable to learn of a single instance in which a case of unquestioned malignant disease has been cured by the Koch treatment. On the other hand, information was received regarding individuals who "promptly died" after taking the treatment. At different times the Wayne County (Detroit) Medical Society has appointed three committees to investigate Koch's "cure." Each of the three reports has been unfavorable. The Koch treatment has been commercialized and it seems evident that large sums of money have been spent in circularizing the profession and the public in the interest of the "cure." The latest move is the establishment of the imposingly named "Koch's Cancer Foundation," with William F. Koch as "Director." There has also been organized "Koch Laboratories, Inc.," which is the sole owner and manufacturer of what Koch calls his "antitoxin." It seems that, while stockholders and members pay $110 for the treatment, patients are charged $300 for the first treatment and $200 for any afterward. The difference between the price charged the Koch disciples and the prices the disciples charge the victim is presumably to cover the risk assumed by the followers of Koch in injecting his secret mixture into the cancer patient. (Jour. A. M. A., May 8, 1926, p. 1469.)

METHYL SALICYLATE — A WARNING

Methyl salicylate in moderate amounts is a powerful poison. While death from the drug has never resulted from its therapeutic use, instances of untoward effects following accidental or intentional self-administration have been reported. Absorption of less than 15 c.c. has repeatedly resulted in death. (Jour. A. M. A., May 22, 1926, p. 1628.)

STUDIES IN PERNICIOUS ANEMIA, WITH ESPECIAL REFERENCE TO HEREDITARY FACTOR, ACHYLIA, AND THE PRESENCE OF ABNORMAL BACTERIA IN DUODENAL CONTENTS*

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There have been, in the literature of the past decade, many observations on possible causal factors operating in pernicious anemia. Some of these have been well substantiated in themselves, and when co-related, might serve as working hypotheses for further investigation into this obscure problem. It has seemed worth while, then, to attempt such a co-relation and lay down certain lines of future study.

Definitively, pernicious anemia is here considered to be a chronic, progressive, hemolytic anemia subject to remissions and exacerbations, but tending to a certain fatal outcome. To establish the diagnosis there must be present the following features at some time during the course of the disease: glossitis; an anemia in which the peripheral circulating blood shows usually megalocytes, hyperchromia and normoblasts; evidence of hemolysis in sclerotics, skin, urine, feces, and duodenal contents; and signs of a subacute combined degeneration of the spinal cord. These signs occur variably depending upon the particular stage of the disease. Added to these is the invariable achylia or achlorhydria.

Addison[14] originally postulated that, furthermore, the cause of the anemia should be indeterminable; and up to the present that has been true. However, by bringing together and evaluating certain data, some more or less tangible ideas may be entertained. These data deal with (1) the factors of heredity, racial occurrence, and geographical distribution; (2) similarity to anemic states due to known causes; and (3) the more intensive cultural study of gastric, duodenal and intestinal contents.

The hereditary factor has been mentioned from time to time, and, although never very exhaustively studied, the more it is investigated the closer one comes to the idea that there is a strong familial predisposition or tendency to pernicious anemia.[1,2] Gulland[14] noted three patients with pernicious anemia whose fathers had died of the same disease, and one whose father, paternal uncle, brother and sister had all died of pernicious anemia. Cabot[14] found two sisters in one family and one brother and one sister in another family. Ellerman[14] had two brothers and the child of one of them with pernicious anemia. Patek[14] traced one family and found two brothers, one sister, an uncle, a paternal cousin with pernicious anemia and two sisters with obscure secondary anemia. Bartlett[14] noted a family of eight in which the father and three sons died of pernicious anemia, and he quotes Klein, who saw a brother and sister with the disease. Guilford[14] had two families—one in which two cousins of the patient had pernicious anemia and whose sister had an aplastic anemia; and a second family in which two brothers of the patient, one sister and an uncle all had pernicious anemia. Mustelin[14] had a patient, her mother and her daughter all suffering with pernicious aenmia and he quotes Schuerman, who saw a mother, daughter, sister and sister's daughter with pernicious anemia and one other sister with achylia. Meulengracht[1] reviews the case for heredity and, in addition to the men noted above, adds Bramwell, Caccini, Gilbert and Weil, Willson, Andrec, Roth, Gram, Decastello, finally adding some observations of his own. All of these men quote only single cases or families, none of them giving any statistics as to the occurrence of a positive history in a series of cases. Levine and Ladd[15] find a positive history in nine out of 143 cases, which is 6.3 per cent, and also a large number (about 40 per cent) of histories of either tuber-

TABLE I

POSITIVE FAMILY HISTORY OBTAINED IN 90 CASES OF PERNICIOUS ANEMIA

1—Father died "diarrhea and anemia."
2—Sister died "chronic anemia with diarrhea."
3—Mother died "chronic anemia with sore tongue."
4—Brother, sister and mother all died of "chronic anemia."
5—Brother died of pernicious anemia.
6—Brother died of pernicious anemia.
7—Sister died of pernicious anemia.
8—Mother died of pernicious anemia, sister died of "chronic anemia."
9—Sister died of pernicious anemia, mother died of lymphatic leukemia.
10—Aunt died of pernicious anemia.

Two additional cases; in one, mother died of leukemia, and in the other, mother died of Hodgkin's disease.

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culosis or carcinoma or both, under which diagnosis pernicious anemia might easily be hidden.

In our records of ninety cases in which any historical data at all were available, ten gave positive histories of the occurrence of probable pernicious anemia in the family. There was also a large percentage (about 30 per cent) of tuberculosis and cancer which might raise the percentage of pernicious anemia still higher. These figures are not, to be sure, conclusive, but do indicate a familial incidence higher than in any similar series of normal cases.

Of interest in this connection also is the work of Draper[16] on anthropomorphic measurements in various disease conditions, pernicious anemia among them, in which he is apparently finding types which seem predisposed—certainly a familial and not an accidental trend.

The evidence for racial or geographic influence is very scanty and what little there is, is unreliable, but the impression is that pernicious anemia is a disease of northern races. Levine and Ladd[15] find this to be true in their series of 150 cases and our own cases also bear out this trend, although our data are not in form to be statistically analyzed. For the present this must remain only an impression, inasmuch as vital statistics are not available for any except northern European countries and the United States. And even these data, in regard to such a disease as pernicious anemia, must be handled with extreme circumspection and skepticism.

That achylia is a constant finding in pernicious anemia is so generally accepted that a given case presenting symptoms suggestive of pernicious anemia, but without an achylia must be placed under some other diagnostic head. Whether the achylia is a precedent factor is debatable. There is good evidence that such is the case. Faber and Gram[2,3] studied 207 cases of achylia and discovered pernicious anemia in twenty-two of them, thirty-seven of the remainder having a hemoglobin below sixty-seven per cent and fifteen of this number below 50 per cent. In a subsequent series of 63 cases of uncomplicated achylia, 36.5 per cent were anemic; in fourteen cases of exophthalmic goiter with achylia 36 per cent were anemic and in thirteen cases of arthritis with achylia 69 per cent were anemic. He summarizes 90 cases of achylia and finds 41 per cent were anemic, although of secondary type (indices .5 to .6).

We have on record twenty-three cases of idiopathic* achylia showing as yet no other evidence of pernicious anemia. It is significant that the blood counts of four of these cases show indices of 0.9 to 1.0. The blood smears of those showing the high indices show certain other suggestive pernicious anemia criteria such as macrocytes and hyperchromasia. In one case of the twenty-three (not with high index) there was noted impairment of vibration sense of the toe joints—and in another (also not a high index) a tuning fork curve suggesting pernicious anemia. Three other cases show pigmented spots on the skin, and such notes as "hair prematurely gray," "early age changes present," etc., are certainly suggestive. Eighteen of the twenty-three cases had white counts done and in these the total averaged less than 7,000, and in three less than 5,000.

TABLE II

IDIOPATHIC ACHYLIA GASTRICA 23 CASES

Hemoglobin	R.B.C.	W.B.C.	Index	Remarks
88%	4496000	4550	1.0	Few macrocytes
86%	4176000	5400	1.49	Skin pigmented Impaired vibra-sense, toes
65%	4424000	4550	.73	Scleroderma
94%	4120000		1.16	One attack of jaundice
78%	4530000	6550	.86	
69%	3840000	4950	.81	
83%	4560000	6350	.92	
70%	3696000		.97	
90%	5089000	6350	.90	
80%	4072000	6750	1.0	Arthritic
70%	4580000	5250	.77	
63%	4490000	5900	.71	Protein sensitization
76%	4290000	5150	.90	Early aging
77%	3930000	8250	.98	
75%	4610000	7700	.81	Mother died pernicious anemia
82%	5200000	7050	.78	Impaired vibration sense One attack of jaundice
76%	4320000	7350	.88	Psychoneurosis
66%	4180000	10750	.80	Colon present in duodenal contents
85%	4990000	7850	.86	Psychoneurosis
78%	4250000		.92	Essential hypertension
80%	4320000	8880	.93	
79%	3296000		1.23	"Suspect pernicious anemia"
65%	4976000			"Suspect pernicious anemia"

*"Idiopathic" is used here to indicate that in none of these cases were the ordinary causes for an achylia found (gallbladder pathology, gastric carcinoma, alcohol, cirrhosis, chronic upper respiratory infection, etc.)

As a separate series we have four cases of achylia which developed pernicious anemia while under observation.

TABLE III

DETAILED CASE OF ACHYLIA WHICH DEVELOPED PERNICIOUS ANEMIA

History of digestive disturbance since 1901.

1919—Achylia first actually determined by gastric secretory analysis.

Hemoglobin	R.B.C.	W.B.C.
58%	2400000	5800
59%	3040000	
57%	4000000	
65%	3888000	

Duodenal contents 10-19-19—Urobilin 600 (normal)
Neurological examination—negative

1920—Hg. 73, R.B.C. 4600000, W.B.C. 8000, Neurological neg. (Rochester)

1922—Hg. 78, R.B.C. 4184000

1925—Hg. 75, R.B.C. 4180000, W.B.C. 5400, Index .91
Smears negative for pernicious anemia.
Duodenal contents—total 19,000—No colon present.
Neurologic examination—"Findings suggest pernicious anemia, but more like tabes."

Three other similar cases, dating from 1915, 1918 and 1919, definitely showing evidence positive for achylia with anemia, finally of pernicious anemia type—all died.

Case reported above, still living.

In sixty cases of pernicious anemia in which the histories were sufficiently detailed to be of value, seven give histories suggesting a pre-existing gastric achylia before the onset of definite pernicious anemia symptoms. Faber[2,3] is noted as saying that in many of his pernicious anemia cases, it could be determined historically that achylia antedated the pernicious anemia by 4, 8 and 10 years. Levine and Ladd[15] also very strongly incline to this opinion.

But every case of achylia does not develop pernicious anemia. In our records are several such, of from five to eight years' standing, and one of twenty-five years, never showing any evidence of pernicious anemia. Assuming, then, that there is a strong familial tendency to pernicious anemia and achylia, and that achylia is a necessary forerunner of pernicious anemia itself, there must be some hemolytic agent acting in or through the gastrointestinal tract eventually causing the anemia of pernicious type.

That hemolysis constitutes the essential pathologic change responsible for the anemia has now been very definitely proved. The metabolism of bile, bilirubin, urobilin, and urobilinogen from hemoglobin has been very well worked out; and that it is through the entero-hepatic system is now certain. The actual seat of the destruction itself and the primary formation of the pigments from hemoglobin has not been so well established. More recent studies have led to the belief that the reticuloendothelial system including the bone marrow is the site of the hemolytic activity; in other words, the destructive process occurs in the blood bed. Such a destructive action has been explained in various ways—as being by direct injury to the corpuscular elements of the blood by an extraneous hemolytic toxin, or that it is due to an acceleration of the normal physiological hemolytic process caused by some influence on the cells of the organ in which the destruction takes place. The first mechanism seems the more likely.

From the very beginning of the study of this disease, attention has been directed to the gastrointestinal tract because of symptoms which either predominate in, or occur in the course of, nearly every case of pernicious anemia. The constancy of achylia with the symptoms arising therefrom and the occurrence of crises with glossitis, nausea, vomiting and diarrhea constitute ample evidence for at least considerable involvement of the gastrointestinal tract, and has led to the search there for the etiological agent.

Combs[14] in 1822, and later Addison[14] in 1849 and 1855, described the disease and called it idiopathic. Barclay[14] reported in 1851 a case of a fatal anemia with sore tongue. Biermer[14] in 1868 attributed progressive anemia characterized by diarrhea and malnutrition to chronic intestinal disorder. The Germans who followed him, Quimbe,[14] Immerman,[14] Eichorst,[14] and finally Ehrlich,[14] greatly confused the issue by an attempt to classify anemias on the basis of morphological changes in the cellular elements of the blood. However, Hunter[14,17] gave stability to the question in 1890 by his classification of:

1. Non-infective anemias
2. Infective anemias
   a. Anemias due to general infection
   b. Septic non-hemolytic anemia
   c. Addison's or glossitie-hemolytic anemia

In the last group, sepsis of the gastrointestinal tract was considered to be a potent factor either actual or predisposing. Note should be made in this connection of the misunderstanding that has arisen regarding Hunter's work. The common opinion is that he considered mouth sepsis, *i.e.*,

pyorrhea, as a causal factor in pernicious anemia, whereas he very clearly indicated that, although pyorrhea might be the focus of sepsis in the non-hemolytic type, in the hemolytic type some other factor was probably also present. In our own experience this has been true. There have been cases of moderate secondary anemia which we have thought might have been due to foci of infection, including pyorrhea; but in a case of true hemolytic anemia of the pernicious type, foci, in the ordinarily accepted sense, have been singularly absent. Such cases do show at times moderate pyorrhea, but by no means as a major lesion. Whether or not long standing sinus disease, with infection of the tonsils and a septic mouth, can cause a secondary gastritis with achylia and hence lead to pernicious anemia is conceivable, but is rather begging the question and almost necessitates the addition of another factor to make it a reasonable hypothesis.

This leads to a passing notice of two other diseases in which the blood picture is similar to that of pernicious anemia, namely, sprue and the anemia of Bothriocephalatus infestation.[1,8] In the former, monilia psilosis, a yeast of the blastomyces type, has been thought by Ashford and Bahr to be the causative agent, as quoted by Wood.[4] This organism has been recovered from the mouth and gums of cases of sprue. Sprue has the glossitis, diarrhea and other gastrointestinal symptoms, the blood picture, and in some few cases, cord changes. Achylia is not a constant finding, although some cases have been reported as developing an achylia after a period of time. Wood,[4] in fifteen cases of pernicious anemia, has recovered monilia from the feces and in numerous cases from the gastric contents. Inasmuch as maltose, a notoriously unstable substance to work with bacteriologically, was used as the differential fermenting medium, some doubt may be expressed as to the presence of the organism unless proved by smear and growth and identification microscopically. We could not satisfy ourselves as to its presence in the few cases in which the attempt was made to isolate it, although it may have been due to our difficulty with the media employed (Sabaroud's and the maltose).

In Finland about one-third of the population are infested with the bothrio, but only about one in one thousand develop the anemia.[8] The bothrio cases have an achylia, but not the cord changes seen in pernicious anemia. Neither the monilia nor the bothrio have ever been found to elaborate any toxin capable of producing hemolysis outside the host.[1] Therefore, in either case, it is reasonable to assume that the so-called specific organisms may only render the hosts susceptible to some other agent, hemolytic in its action either in or through the gastrointestinal mucosa. For it is known, at least in bothrio cases, that the anemia may persist and run its fatal course after the worm itself has been expelled permanently from the host. Also, bothrio cases seem to have a tendency to run in families and to alternate with true pernicious anemia.[1]

There is in the horse a condition similar to pernicious anemia caused by the toxin liberated from the larvæ of a fly, œstridia, found in the subject's mouth and stomach. The toxin from this fly larvæ, when injected, can produce a hemolytic type of anemia in a normal horse, but the larvæ themselves never cause it by ingestion.[8]

A hemolytic type of anemia is known to occur in pregnancy, lues, carcinoma, and in cases of partial obstruction of the small bowel (as by tuberculosis or typhoid ulceration).[1,5,6,8] Hemolysis can be caused by chemical substances; arseniureted hydrogen, carbon monoxide, trinitrotoluene, and phenylhydrazine. An anemia like pernicious anemia has been produced by beta-oxyphenylethylamine, a substance found in putrid meat, Swiss cheese, and in ergot. This tyramin can be produced by the action of colon or other bacteria on tyrosin in the gastrointestinal canal.[14]

From a consideration of these conditions, namely, horse anemia, sprue, bothrio anemia, and the other hemolytic types found in lues, cancer, tenia infestation, pregnancy and chronic small bowel obstruction, it would seem that some toxic substance must be found in the alimentary tract of pernicious anemia subjects.

That the flora of the intestinal tract in pernicious anemia differs from the normal has been determined by many different observers, but has not been particularly investigated during the present work. The mere fact that pernicious anemia subjects are achylic would indicate that certain putrefactive and proteolytic bacteria would preponderate. The organisms of this type are principally the colon group and the spore group. Of the first, the *Bacillus coli* is the main one and in the latter, *Bacillus welchii.*

Moench, Kahn and Torry[18] and also Cornell[21]

have examined the *Bacillus welchii*, but a study of their work does not give credence to the idea that such an organism is a causative factor. In the first place it is a normal inhabitant of the colon in certain individuals, and why it should act as an hemolytic agent in some and not in all is hard to conceive. Furthermore, any agent, in order to act dangerously in the intestine, must do so higher up than the colon. And the *Bacilli welchii* have not been demonstrated as being anywhere in increased numbers except in the feces. The monkey injections are not conclusive. Only three animals were used in which an anemia was produced morphologically similar to pernicious anemia, but it was not proven in these instances to be hemolytic by any other examination.

The work of Seyderhelm[5,6,7,8,9,10] and others in Germany seemed to give greater promise. These men recovered colon bacilli from the gastric contents of cases of pernicious anemia in the majority of specimens examined. Wichels[10] presents the largest series. In thirty-six cases of pernicious anemia, colon bacilli were found by him in thirty cases in large numbers, in small numbers in three cases, and none in three cases. The work was done by plating methods and isolation, identification "by the usual methods." All these cases of pernicious anemia naturally were achylic. In cases of achylia from other causes colon bacilli were never found. In six cases of gastric cancer (three of which had acid present) colon bacilli were found four times. In eighteen cases of anacidity from various causes, colon bacillus was found three times, fourteen specimens were sterile and one showed mixed infection. In eight cases of gastric and duodenal ulcer with normal or hyperacidity, only sterile cultures were obtained. In twenty-three cases of normal gastric acidity, colon bacillus was found only once, one specimen was contaminated by subtilis and the others were sterile. Other workers reporting in the literature give essentially the same results. In criticism it may be said that colon bacillus will grow only with great difficulty in any acid medium, and therefore its absence in an acid stomach does not mean that the organism might not be as high up as the duodenum, which is usually alkaline, or at any rate in the jejunum, which is always alkaline. Inasmuch as colon bacillus has been reported frequently as inhabiting the small bowel in various conditions, it seemed that demonstration of the bacillus in the duodenum would be the only sound procedure upon which to base any conclusions as to its etiological significance in a given disease such as pernicious anemia.

The technic as given by most of the authors reporting was followed, although no elaborate chemical sterilization of the mouth was attempted, inasmuch as that is a practically impossible procedure. Our subjects were instructed to eat a light supper and report in the morning without breakfast as usual for a duodenal examination. They were further instructed to take more than ordinary care in brushing the teeth and cleansing the mouth, but were allowed to do it in any way which was habitual with them. The duodenal tube and tip was sterilized by boiling and introduced with the least handling and contamination possible. In this connection the report of Wichel, and others, of sterile cultures is amazing. A sterile specimen was never obtained by us even with the most careful technic. The usual mouth flora was always present. For that reason then, the preliminary cultural procedures were abandoned. A few drops of the duodenal juice were implanted by platinum loop into broth, incubated for twenty-four hours and transplanted into the sugar media. An attempt to determine by smears, plating, or other methods the actual flora present was almost impossible on account of the overgrowth of streptococci, staphlococci, catarrhalis and other mouth organisms. Overgrowth by yeasts, subtilis, fungi, or other contaminating organisms was never encountered. The presence or absence of colon bacillus was determined by the reaction in the sugar media. Dextrose, mannite, maltose, saccharose, and lactose were used. Colon bacilli ferment all of these. Saccharose was used to differentiate between communis and communior (although that is of little importance). These sugars were used principally to differentiate from the typhoid-paratyphoid group and the dysenteries. Occasionally *Bacillus acid lactici* interfered with *communis*, and *Bacillus lacti aerogenes* with communior. The results obtained are shown in Table IV.

This series is smaller than the largest quoted above from Wichels,[10] but compares favorably. In fact, for the study of the problem at hand, perhaps the results are even more accurate. There was never contamination, although an absolutely sterile culture was not obtained, which means that the material was handled in a natural manner; that is, overuse of chemicals in the mouth or stomach

did not kill off whatever organisms there might be present. The material was aspirated directly from the duodenum, which offsets the factor of acidity of the medium itself, one of the criteria of true duodenal contents being alkalinity. And finally, the colon bacillus was identified by sugar fermentation, which method most of the workers, except possibly Wichels, did not use.

TABLE IV

THE OCCURRENCE OF B. COLI IN DUODENAL CONTENTS

Pernicious anemia—14 cases
B. coli present in 11
B. coli absent in 3
Other achylias—
Carcinoma of the ascending colon. B. coli present
Idiopathic. B. coli present
Idiopathic. B. coli present
Polycystic kidney. B. coli present
—4

Idiopathic. B. coli absent
Idiopathic. B. coli absent
—2
Acid stomach—
Cirrhosis of liver. B. coli present
Acute catarrhal icterus. B. coli present, small numbers
—2
Typhoid suspect carrier. B. coli absent
Secondary anemia (hemorrhoids). B. coli absent
—2

Bacilli coli were not isolated in as great a percentage of cases as by most of the German workers, but the colon bacillus was found in certain conditions where they failed. In fact, the most significant finding in this work has been not so much the finding of the colon in cases of achylia (whether pernicious anemia or not) but finding of the bacillus also in acid cases. In the four acid cases studied, B. coli was recovered in two. Of almost equal significance is the finding of B. coli in three cases of achylia where no evidence of pernicious anemia obtained.

What then is the significance of these findings? In the first place, as before stated, B. coli can very seldom be found in an acid medium in any event.[11,12,13] That is, even if the colon bacillus should migrate up the small intestine, in the presence of an acid gastric secretion it would never be there in abundance.[20] Also, colon bacilli have often been found by ourselves and others[11] in infected bile; and bile of course is present constantly in any duodenum and small intestine. Perhaps, then, the finding of B. coli in the bile-laden duodenal contents in a given case may mean simply liver or gallbladder infection, irrespective of the presence or absence of pernicious anemia. It has never been demonstrated clinically that the colon bacillus liberates a hemolytic toxin,[19] in spite of the fact that its growth often hemolyzes culture media. Cases of colon wound infection, colon cystitis and pyelonephritis, colon peritonitis, never show any evidence of blood destruction even in the most severe general sepsis. To comply with all the requirements, an extract of colon bacillus should produce an hemolytic anemia in animals. Seyderhelm[6] did produce an anemia showing a +1 index in dogs, but he found the same thing with injections of streptococci isolated from the intestine and also with cholera-vibrio extract. And furthermore, it must always be borne in mind that the mere presence of an anemia after the injection of a foreign substance, even if showing so-called diagnostic criteria of pernicious anemia, is not such unless increased pigment content of the bile, urine and feces can be demonstrated. If not so demonstrated, it is doubtful whether an actual hemolytic process has taken place, and unless the anemia is of proved hemolytic type it is not pernicious anemia.

The mere presence of colon bacilli high up in the intestine does not indicate that the organism is in itself toxic.[20] It is rather simply further corroboration of the fact already demonstrable by other signs (achylia, glossitis, etc.) that the gastrointestinal tract is in an abnormal condition. Furthermore, if changing the flora of the gastrointestinal tract could influence a general disease such as pernicious anemia, some therapeutic results should be noted when such is done. But feeding of lactic acid bacilli cultures, yeast, acidophilus, and various other organisms has very little effect on the disease. Ileostomy, at first advocated by Seyderhelm and done under his direction was ineffective in controlling cases of pernicious anemia. If the *Bacillus coli* or *welchii* had anything to do with the situation, for the many years that hydrochloric acid has been used (and when so used it drives the colon bacilli, if present, further down the intestine) some relief should have been effected; but the progress of the disease is the same, although the symptoms may be relieved. Lastly, in an hemolytic crisis, it is not alone the stomach and bowel which is affected, but the whole tract, mouth, tongue, esophagus, stomach and bowel.

The actual damage which results in the bone marrow and the blood bed generally must be produced by some bacterial or chemical toxic agent. Such an hemolytic agent is probably not the colon or any other hitherto discovered inhabitant of the intestinal tract or any chemical substance as yet known acting through the intestines unless artificially introduced.

The principal pathological finding in pernicious anemia, aside from the changes in the hematopoietic system itself, is that of atrophy of the gastrointestinal tract. The conclusions from the postmortem material of the gastrointestinal tract cannot be too finely drawn on account of the well known immediate post-mortem changes, but even discounting this fact, many pathologists have been impressed with the appearance of atrophy, mucosal and muscular, of the stomach and gut.

CONCLUSIONS

1. There is a strong familial tendency in pernicious anemia.
2. Achylia is a constant factor present in pernicious anemia.
3. Achylia probably precedes the onset of actual pernicious anemia signs and symptoms.
4. The presence of normal large bowel bacteria high up in the small bowel is to be expected in the presence of an achylia.
5. Such a phenomenon indicates merely that the gastrointestinal tract of pernicious anemia subjects is in a state of abnormality.
6. Such a state of abnormality would render it very susceptible to the action of any toxic agent.

BIBLIOGRAPHY

1. Meulengracht: The hereditary factor in pernicious anemia. Am. Jour. Med. Sc., V. 169, 177. Feb., 1925, No. 635.)
2. Faber and Gram: The relation between gastric achylia and simple and pernicious anemia. Arch. Int. Med. V. 34, 658. (Nov., 1924.)
3. Faber and Gram: The association of achylia and anemia of different types in three members of the same family and the behavior of the color index in pernicious anemia. Arch. Int. Med., V. 34, 827. (Dec., 1924.)
4. Wood: Pernicious anemia in its relation to sprue. Am. Jour. Med. Sc., 169, 28. (Jan., 1925, No. 634.)
5. Seyderhelm: Die Bedeutung des Dünndarms für die Genese des perniziösen Anämie. Klin. Wchshrft. 3 Jahrg. Nr. 14.
6. Seyderhelm: Undersuchungen zur Pathogenese der perniziösen Anämie. Klin. Wchshrft. 2 Jahrg. Nr. 22.
7. Seyderhelm, Lehmann und Wichels: Experimentelle intestinale perniziöse anämie beim Hund. Klin. Wchschrft. 3 Jahrg. Nr. 32.
8. Seyderhelm: Die Pathogenese der perniziösen anämie (Monograph). J. Springer, Berlin, 1922. Contains also a complete German bibliography.
9. Winterfield: Die Behandlung der Perniziösen anämie mit Koliautovakzine. Münch. Med. Wchschrft. 71 Jahrg. Nr. 7. (Feb. 15, 1924.)
10. Wichels: Uber das Vorkommen von Bacterium Coli im Inhalt des nüchternen Magens bei perniziöser Anämie Zeitshrift f. Klin. Med. Band 100, Heft 5, Seite 535.
11. Park and Williams: Pathogenic Micro-organisms. Lea and Febiger, 1914.
12. Hiroma Tsuchiya: Clinical diagnosis and the intestinal flora. Arch. Int. Med., V. 36, 636. (Nov., 1925.)
13. McNeal, Latzer and Kerr: The daily excretion of bacteria in the feces of healthy men. Jour. Inf. Dis. V. 6, 123 and 571. (1909.)
14. Sheard: Pernicious anemia and aplastic anemia. (Monograph.) Wm. Wood, 1924. (Contains also a complete bibliography of the pertinent literature.)
15. Levine and Ladd: Pernicious anemia: A clinical study of 150 consecutive cases with special reference to gastric anacidity. Johns Hopkins Hosp. Bull., V. 32, 254. (1921.)
16. Draper: Human constitution. W. B. Saunders, 1924.
17. Hunter: Severest anemias. Wm. Wood, 1909.
18. Moench, Kahn and Torry: Analysis of fecal flora in 33 cases of pernicious anemia. Jour. Inf. Dis., V. 37, 161. (Aug. 1925.)
19. Dodgeon, Wordley and Bawtree: On bacillus coli infections of the urinary tract, especially in relation to hemolytic organisms. Jour. Hyg., V. 20, 137. (October, 1921.)
20. Coates: Pernicious anemia with foci of infection in the alimentary canal. Brit. Med. Jour., V. 1, 667. (Apr., 1923.)
21. Cornell: A chronic infection with B. welchii. Jour. Inf. Dis., V. 36, 245. (May, 1925.)

EKSIP FOR DIABETES

One Mathew Richartz of New York City is exploiting the sufferer from diabetes through the sale of a nostrum "Eksip." The advertising slogan for Eksip is: "No More Dieting, No More Starving, Eat and Get Well." Diabetics are urged to write for a booklet entitled "Eat and Get Well" which Richartz sends to anyone who asks for it. While the newspaper advertisement leads to the belief that with Eksip no dieting is necessary, in the booklet the victim is urged to avoid foods high in carbohydrates until after Eksip has cured the diabetes. Furthermore, the diabetic is warned after he has purchased the nostrum that he should not abandon the diet to which he has been used. The A. M. A. Chemical Laboratory analyzed Eksip (which comes in tablet form). From this analysis it may be concluded that Eksip contains essentially magnesium carbonate and starch. (Jour. A. M. A., May 22, 1926, p. 1641.)

THE NASAL SEPTUM*

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Duluth

The development of surgery of the nasal septum has been gradual and has developed from a simple removal of septal spurs or of a major deflection, which was blocking the nares and preventing the respiratory functioning of the nose, to what is known as a complete resection of the nasal septum, which is now accepted as the proper technic, and which is performed for the relief of many and varied conditions, such as frontal and ethmoidal sinusitis, otitis media, tubal obstruction with deafness, bronchitis often accompanied by asthma, dermatological conditions that depend upon a focus of infection as a causative factor, and others.

Resection of the septum was at first performed only as a means of opening up the nose for breathing. Gradually it became evident that people received benefit in addition to the breathing, many people having been relieved to some extent of chronic headaches, nasal discharges, etc. On examining more closely, the reason for this was apparent, the frontal headaches being relieved simply by taking the pressure off the anterior portion of the middle turbinate, which would be wedged in by the septum into the infundibulum of the frontal sinus. Releasing the pressure on the turbinate by removing the septum will allow the turbinate to hang away freely from the outer wall, and thus open the infundibulum to frontal drainage. Ethmoiditis is relieved by freeing its openings in the same way. Tubal catarrh is also relieved by removing pressure from the fossa of Rosenmueller and giving the auditory tube a free opening. Relieving a sinus infection would in turn help to relieve a bronchitis, which had resulted from it. Removal of the septum should provide for free ventilation of all nasal mucous membranes, and in this way help re-establish the normal physiology of the nose, which is, (1) free passage of air through the nares; (2) warming of the air before being taken into the pharynx and lungs; (3) moistening of the air; (4) filtering out any dust particles; (5) allowing free passage of air to the sinuses which act as resonance chambers for the voice; (6) aiding the sense of smell and taste; (7) ventilation of the eustachian tube.

In doing nasal surgery in an effort to re-establish nasal physiology, one's chief concern is preserving the functioning tissue of the nose, which is the erectile tissue or mucous membrane of the turbinates and anterior portion of the septum. This mucous membrane is a self-regulating mechanism whereby heat and moisture are supplied to the inspired air. Therefore, the size of the turbinates varies according to the temperature and humidity of the air. It has been estimated that the nose secretes over one liter of water every twenty-four hours. This helps explain the dryness and injury to the bronchi and lungs where the nasal functions are impaired, especially in this climate, where one is housed in so much of the year.

Bacteria, which enter the nose proper, are expelled by the action of ciliated epithelium assisted by lachrymal secretion and the mucous discharge from the sinuses. The activity of the organisms is arrested by the mucus, which is inhibitory, if not actually bactericidal. The organisms enmeshed by mucus are open to attack by the phagocytes. Experimentally, cultures of non-pathogenic organisms have been introduced into the nose, and they rapidly disappear. Therefore, while there are many organisms in the vestibule of the nose, there are but few in the nasal cavity proper. Accessory sinuses in animals are nearly always sterile. When thousands of organisms enter the nose every hour, the necessity for normally functioning mucous membranes is evident. Ciliated epithelium once destroyed never again regenerates.

Symptoms of nasal diseases produce both local and remote symptoms:

1. Symptoms in the upper air passages
   a. diminished nasal respiration,
   b. reflex effects,
   c. descending infections of the air passages.
2. Digestive troubles due to
   a. mouth breathing,
   b. swallowed septic matter.
3. General and developmental troubles
   a. insufficient respiration and consequent inadequate hematosis,
   b. exaggerated efforts at inspiration and consequent deformities of chest and spine in childhood,
   c. chronic auto-toxemia.
4. Cerebral affections consequent on

*Thesis before the Minnesota Academy of Ophthalmology and Otolaryngology, March 12, 1926.

a. intimate connections between the vascular and lymphatic circulations in the nose and brain,
b. the immediate anatomical relationship of the nasal fossa and accessory sinuses to the brain.

5. Affections of eye and ear.
6. External affections of nose, as congestion thickening, eczema, acne, etc.

Deflected or thick septums are responsible in most cases for disarranging the balance between the two nostrils, and thus interfering with nasal function.

Among civilized people some deformity of the nasal septum is very common. Predisposing causes are: (1) diatheses, as syphilitic, tuberculous or rachitic; (2) racial characteristics. Civilized people have deflected septums much more frequently than savage races. The examination of 2,152 European skulls showed 75 per cent with deflected septums. The skulls of Mongols, Africans and Polynesians showed only 20 per cent with deflected septums. The examination of four hundred skulls in Paris showed that the facial angle is more and more inflected in an ascending series from the anthropoid ape to the European, and progressively with this the septum is more prone to deviation.

Postnasal causes of deflected septums are adenoids, which, by closing off the posterior openings of the nose, cause: (1) the narrow nose externally, which is due to collapse and falling together of the external nasal bones from lack of function; (2) a narrowing of the lumen from the action of the air passing through a free side, where one posterior opening is partly open, forcing the septum into the opposite cavity.

A frequent cause of deflection is traumatism. The nose with a deflected septum in the region of the middle turbinate, even though the deviation does not interfere with respiration, is prone to cause trouble. In acute rhinitis, where few changes have occurred in the epithelium, such as a loss of a few cilia or desquamation of the upper layers of the membranes, resolution is often extended over several days in noses with high deviation of the septum, and in these noses chronic rhinitis is of common occurrence. Pus and discharge may be held between the closely coapted nasal surfaces either between the septum and the turbinate, or between the turbinate and the lateral wall of the nose. In these noses the vessels are engorged and beginning hyperplastic changes are to be found.

The next stage in nasal "catarrh," so-called, is hypertrophic rhinitis. Here the epithelial layers are increased, the upper ones becoming more flattened and the ciliated cells remaining only in places. The vessels are dilated and thickened, and surrounded by small cell infiltration. There is an increase of the interstitial tissue, and with it a polypoid formation takes place, usually along the inferior turbinate first. Because of the long continued suppuration the sinuses become infected, and the bathing of the hypertrophied turbinates in pus continues from the infected sinuses.

The next stage is an atrophy of the nasal mucous membranes, and a rarefying osteitis of the turbinate bones. Thus, osteitis begins in the inferior turbinate first, and indicates a beginning atrophic rhinitis. The fetid odor will later develop from further bone necrosis and infection and pass into a condition known as ozena. Thus it is that the various nasal conditions are a progressive process from the rhinitis through to the ozena, provided they develop that far.

An acute rhinitis, with an especially virulent organism, may rapidly involve the sinuses, the local swelling obstructing the normal drainage. These cases respond to local shrinkage and suction.

Mithoefer gives seven reasons for failure in nasal treatment, as follows:

1. "Lack of knowledge regarding the anatomic variations of the sinus cavities, especially the ethmoid.
2. Negligence in not making a general physical examination of the patient before the operation.
3. Lack of persistence in trying to relieve the patient with conservative treatment of the nose.
4. Insufficient consideration and examination of all sinuses and the nasal mucosa before operating.
5. Lack of knowledge regarding the character of the infection.
6. General anesthesia.
7. Insufficient after-treatment."

In enlarging on the above:

1. The *x*-ray will show anatomic variations, which means principally a lateral displacement of the ethmoid labyrinth. An ethmoid cell occasionally extends down behind the antrum, or may extend out over the orbit.

2. Lack of physical examination. The aged should be operated on only if absolutely necessary.

Eyes, tonsils and teeth must be ruled out as cause of trouble. Headache may be due to a hypothyroidism. Often a myalgia of the neck muscles (which is the result of infection) causes severe headaches, which radiate from the occiput to the forehead. They are characterized by tender sternoclavicular joints and painful cervical vertebræ on pressure. Simply relieving a sinus infection in such an instance is not enough; massage and additional treatment are also needed. A chronic bronchitis will not always disappear by relieving the sinuses, but the cough must also be treated.

3. Cases of nasal neurosis, where the patient has headache, sneezing and hypersecretion, will show but little nasal pathology, and should be treated by other means than surgery, as surgery will not help them.

5. Do not operate where a streptococcus hemolyticus infection is present, or where there is too much pus. Here some other treatment should be used first.

After-treatment is very important. Many patients do not obtain good results because of lack of after-treatment. The patient must be under observation for some time. Many patients need medical treatment and should be under the management of an internist as well. It must be kept in mind that removing the septum does not remove the infection. It simply is an aid to nature, and time is needed to effect a cure. The sinus draining freely will empty itself, and thus allow the mucous membranes which line the sinus, to return to a healthy condition. The object of the after-treatment is to keep the nostrils free from crusts and swelling, in order that air may pass freely and unimpeded.

In view of the discussion of the last few years relative to the value of the radical sinus operation as compared to the more conservative measure of septal resection, Dr. F. J. Hirschboeck, of the Department of Internal Medicine of the Duluth Clinic, and I have tabulated the results of approximately 300 septal resections performed by me since I have been with the Duluth Clinic. Form letters were sent out to all these patients and 100 replies were received. The patients were asked to state the reasons they had had for having the operation performed, since they are best able to evaluate the improvement in symptoms regardless of what the objective findings may have been. The letters received were considered to be fairly representative of the composite whole. All cases were ones in which no other sinus operations had been performed. Patients' replies were recorded according to relief, if any, that was noted for the various symptoms of which they complained, so that the operation as a whole might be satisfactorily reported.

The following form letter was mailed out, and the replies tabulated and arranged for study and deductions.

Dr. Armstrong and I are preparing statistics for the purpose of estimating the influence of septal operations on certain conditions frequently complained of and dependent upon deformity of the nasal septum.

Most of the patients who have to have an operation of this type performed seek help on account of:

1, Catarrh.
2. Difficulty in nasal breathing.
3. Sinus infection.
4. Headaches.
5. Discharge in the back of the nose and throat.
6. Chronic cough.
7. Asthmatic bronchitis.
8. Rheumatic aches or pains.
9. Difficulty with hearing or discharging ears.
10. Recurring head colds, with or without bronchitis.

I wish that you would kindly underline the conditions enumerated from which you were suffering before you had your nasal operation, and advise me at the bottom of this sheet as to the relief obtained since. The relief engendered can be measured by using the words "Cured," "Improved," or "Not Improved."

If other symptoms have developed, please advise us.

Please note also whether you are still under observation, and if you consider the operation satisfactory in some measures and not in others.

Realizing the difficulty patients sometimes have in properly interpreting their symptoms, we should be very glad to have you come into the office, without any expense to you, so that we may ascertain for ourselves the benefits you may have derived from the operative procedure.

If you have seen some of the other doctors in the Clinic, and if you should prefer to consult them, we wish you would please bring this letter and present it to them at the time of your interview.

This information will be extremely valuable to us in working out the value of an operation of this type, and since we feel that some of the symptoms enumerated above are more responsive to this operative procedure than others we are endeavoring to get these mathematical data together for the benefit of our patients and ourselves.

Very sincerely yours,

F. J. Hirschboeck, M.D.

It was noted that the most common symptom complained of was difficulty in nasal breathing. Eighty-two per cent of the patients complained of this difficulty alone.

The next most common complaint was recurring

colds, with or without bronchitis. This class of patients represented 57 per cent of the total.

The next in order of frequency was nasal discharge through the nostrils or back into the throat. This complaint was noted in 52 per cent.

Headaches were given as a complaint in 42 per cent of the whole number of patients.

So-called "catarrh," which is an indefinite complaint, but probably comprises nasal obstruction in breathing with discharge, was complained of by 25 per cent of the whole. This term catarrh was included in the questions simply because so many patients speak of their trouble as catarrh and pay no attention to other terms.

Other complaints were: rheumatic aches and pains, 16 per cent; earache or impaired hearing, 13 per cent; sinus disease, 13 per cent; chronic cough, 9 per cent.

Two patients complained of nasal bleeding because of incrustation in the base of the concavity of the septum. One complained of sneezing and one of urticaria. The complaint of sinus disease was at least an ethmoditis and in some instances was accompanied by frontal and maxillary sinus disease as well.

There were only three unsatisfactory responses received from the 100 replies, or 3 per cent of the total. Eighty-two patients with nasal obstruction, or 90 per cent, reported improvement, and fifty of these, or 60 per cent, a complete cure. Of this number, twenty had had previous operative measures previously performed without relief. There were eight patients, or 9 per cent, who claimed no relief.

It is obvious that nasal obstruction would be the symptom most often relieved, the next in order being recurring colds, headaches and nasal discharge. The more chronic symptoms, such as so-called "catarrh," chronic cough and asthmatic bronchitis, would probably be less responsive to treatment, at least in the period under observation (one to three years). It may be that in a future analysis of the records, some improvement in these chronic conditions may be noted.

Of the patients complaining of recurring colds (fifty-seven in all), forty, or 70 per cent reported improvement to cure, seventeen, or 29 per cent, no improvement, and twelve, or 21 per cent, considered themselves entirely relieved. Of the fifty-three patients complaining of discharge in nose and throat, thirty-nine, or 74 per cent, were improved or cured, fourteen, or 26 per cent, had no improvement, and eleven, or 21 per cent, considered themselves entirely cured. Forty-two patients complained of headache. Eleven, or 26 per cent, were entirely cured, thirty-three, or 80 per cent, of the forty-two considered themselves from improved to cured. Nine, or 20 per cent, reported that they had no improvement from the operation, but five of these stated improvement from subsequent measures such as tonsillectomy and correction of refractive errors.

Of the twenty-five patients complaining of catarrh, which is a rather elusive symptom, sixteen, or 64 per cent, admitted some improvement or cure, and nine, or 37 per cent, no relief.

Of the patients who had a beginning deafness or catarrhal conditions of the eustachian tube, eight of the thirteen, or 62 per cent, reported relief or cure.

Eleven of the fifteen, or 74 per cent, reported relief from rheumatic aches or pains.

The asthmatic bronchitis cases reported improvement or relief in 50 per cent of the cases, although even in the cases reporting complete cure, râles were still present in the lungs, as reported by Dr. Hirschboeck on chest examination. This is possibly due to scar tissue formation.

The one case each of urticaria and sneezing reported cures, or 100 per cent results.

Summarizing: The operation for septal deflection when properly done is as effective in relieving nasal and perinasal sinus infections as any operation heretofore advanced, without the necessary protraction of illness with the economic loss of time. Nasal obstruction, headache, discharge and recurring colds are certainly improved in the vast majority of cases, and in the greater part are definitely cured. This is accomplished by the promotion of sinus ventilation and drainage. It is an absolute cure for hemorrhages from the nose due to incrustations in the deflected septum and should be used more often for this condition.

Asthmatic bronchitis, or chronic bronchitis, due to sinus disease, is frequently relieved but rarely cured. This is also true, so Dr. Hirschboeck has observed, in cases where more radical sinus operations had been performed. Other foci of infection must also be eradicated as far as rheumatic aches and pains are concerned.

REFERENCES

Thompson: Diseases of the nose and throat. Appleton. 1916.

TOXEMIA OF PREGNANCY

A Review of Some of the Recent Literature on the Subject With a Report of Additional Cases From the Touro Infirmary and the New Orleans Charity Hospital

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Since 1918, when Duncan and Harding[1] first published the theory that pregnancy toxemia was caused by a carbohydrate starvation and could be successfully treated as such, there has appeared in medical literature a great deal of discussion of this condition: its etiology, pathology, and, most important, its treatment with carbohydrate feeding in some form.

In 1920, Titus,[2] following this same theory, published a series of cases treated with glucose and first advocated the intravenous administration of this sugar.

With the discovery and introduction of insulin, this line of treatment has broadened and Thalheimer[3] in 1924 advocated the use of glucose by vein and, with it, sufficient insulin to insure its utilization by the tissues.

Since then, with the improvement of accurate laboratory methods, the discussion has centered around the physiological and pathological chemistry of the condition, with an attempt both to perfect the treatment and to differentiate the various forms of toxemia and to establish the treatment and prognosis of each.

Further study of the question has developed, through the work of Enright,[4] Maase and Zondek,[5] Papow,[5] Jackson[5] and others[6] that practically the same degeneration of liver structures occurs in cases of starvation, acidosis of diabetes and the toxemias of pregnancy and that these and dehepatized dogs all develop an acidosis shown by a low CO_2 combining power and by acetone bodies in the urine and, further, that all presented the same terminal picture of convulsions, coma and death.

In the second series published by Titus[2] with the intravenous glucose administration in sixty-eight cases, there were five deaths, one of which was from hemorrhage. These fatal cases showed, at postmortem, a remarkable regeneration of the liver structures, making it almost impossible to make a post-mortem diagnosis of pregnancy toxemia, thus proving by the rapid regeneration of liver tissues that the carbohydrate treatment is not only a palliative treatment to tide over the time of delivery but an actual curative procedure and emphasizing the remarkable ability of the liver to regenerate after serious damage.

The four that died of toxemia, however, showed a very small amount of absorption during the first hour after the injection, indicating an inability on the part of the tissues to utilize the glucose. This condition would suggest that, in these cases, insulin might have been an aid.

The success of the treatment with carbohydrates either with or without insulin naturally centers a good deal of attention around the matter of blood sugar as well as the laboratory picture of acidosis, namely, the lowered CO_2 combining power of the blood and the presence of acetone bodies in the urine—conditions that are found present by all investigators I have studied.

In December, 1925, Stander and Duncan of the Johns Hopkins Hospital published a series of cases of toxemia developing eclampsia in which they report a low CO_2 combining power as a constant condition and in which they lay some stress on their findings of a high blood sugar which, in a former publication,[8] they state to be a constant factor.

Coincidently with their work and quite independently of it, Walter E. Levy of the Touro Infirmary of New Orleans was gathering a series of cases at the clinic of that institution in which he found a low CO_2 combining power, which condition he found to be not only a constant factor but often an early factor in pre-eclamptic cases: a factor which, when detected early, served as a warning to institute treatment and prevent cases from going on to a true eclampsia.

His findings in the matter of blood sugar, however, differ so materially from those of Stander and Duncan that I was prompted to make a careful review of his cases and check them against a small series of cases occurring at the Touro Infirmary and the Charity Hospital during the months of January and February of 1926, in all of which I found that either a normal blood sugar or a condition of hypoglycemia existed.

These cases (Table 1), with those published by Levy[12] and herein reviewed and the findings of Rawley,[9] Williams[10] and Faber,[11] prove conclusive-

ly that toxemias of pregnancy do not always present a hyperglycemia but rather that many are normal in their blood sugar and many more present a hypoglycemia.

This study is made in an effort to determine the cause of the difference between the findings at the New Orleans institutions and those of Stander and Duncan and, if possible, to harmonize the findings of these institutions, the accuracy of none of which can be questioned.

In reviewing Levy's cases, a part of which are published in Surgery, Gynecology and Obstetrics,[12] I first threw out all cases the record of which omitted any of the necessary points for a complete study and found remaining thirty-five. These naturally divide themselves into two groups on the principal point of difference, namely, blood sugar. Group I numbered twenty-six cases that carried a low blood sugar averaging 79.4, and Group II, nine cases with a normal or high blood sugar averaging 126.2.

Both groups show a low CO_2 combining power averaging, in Group I, 42.7, and in Group II, 42.

In gathering this series, the test of diastatic activity of the urine was made and cases with a low diastase, indicating a renal involvement, were not included; which fact, it appears, accounts for the greater preponderance of hypoglycemia in the cases reported. The borderline and overlapping cases are found in the hyperglycemic group as indicated by a study of the complete records of the cases.

I wish here to emphasize the value of the diastase test as a diagnostic and prognostic factor in all pregnancy toxemias and, in view of its simplicity, the advisability of its more general use. Cases giving a high diastase may safely be placed among the simple toxemias and those with a normal or low diastase have probably a nephritic background.

Both these investigators follow rather closely the methods of Thalheimer[3] in administering glucose intravenously with insulin, and both report the same favorable results. The treatment, in the main, consisting in the intravenous injection of 600 to 1,000 c.c. of a 10 per cent solution of glucose and with it (Thalheimer) or simultaneously by hypo (Levy) of about one unit of insulin to each three grams of glucose.

This treatment is based on one or both of two theories:

1. That pregnancy demands a greater consumption of carbohydrates to nourish the growing fetus and to meet the demands made by a rapid hypertrophy of the uterus, these factors not only depleting the tissues of their carbohydrates, but the liver of its physiological store of glycogen which is normally present to meet unusual demands.

2. That through an excessive demand for carbohydrates, the liver has lost, not only its store of glycogen and its ability to store carbohydrates, but, also, by a degeneration of its own structures, its ability to protect the body against toxemias of various kinds including infections and the toxemias incident to acidosis.

Both these theories involve a vicious circle in which the weakened organism demands more carbohydrates and, from the lack of these, becomes less able to appropriate and metabolize the needed material, even in the presence of an available supply.

The available supply of carbohydrates in the body is represented by the sugar content of the blood, the stored glycogen and the sugar metabo-

TABLE I

Charity—	Blood Sugar	CO_2 Comb. P.	P.S.P.	Diagnosis
Case 1	76	Not taken	20	Pre-eclamptic Toxemia
Case 2	85	Not taken	25	Pre-eclamptic Toxemia
Case 3	76			Pre-eclamptic Toxemia
Case 4	95*	45*		Post-eclamptic Toxemia
Case 5	100	40	35	Pre-eclamptic Toxemia
Case 6	76	Not taken	20	Pre-eclamptic Toxemia
Touro—				
Case 1	107	36.5		Pre-eclamptic Toxemia
Case 2	91	51.4		Pre-eclamptic Toxemia

*Taken after the administration of glucose.

lized from the proteins. The source of supply is represented by the food taken by mouth or otherwise, including that given intravenously.

The ability to metabolize these available supplies into tissue is represented, at least mainly, by the ability of the pancreas to produce sufficient of that mysterious product arbitrarily named insulin.

That insulin has the power of making carbohydrates in the blood immediately available for tissue metabolism is proven by Mann's[6] experiments in keeping dehepatized dogs alive on glucose and insulin, as in this condition it is manifest that there can be no storage of glycogen in a liver that has been removed.

Toxemias of pregnancy have been shown[6] to present the same pathological picture as starvation in a depletion of the liver of its glycogen and finally in a degeneration of the organ itself. Toxemia also resembles starvation in that the end-results are acidosis with convulsions, coma and death. Of this terminal picture, Mann's dehepatized dogs presented an exact parallel.

All these proven facts furnish a rational foundation for the use of glucose as an available carbohydrate in the treatment of these conditions and of insulin when needed to enable the tissues to utilize the store of carbohydrates thus made available.

Another point that becomes evident in studying the cases published by various investigators is that, even in cases that show a hyperglycemia, there is a distinct deficiency in carbohydrate metabolism resulting in an acidosis.

It took a long time for dietitians to realize that food taken into the alimentary canal was still outside the body until it was digested and assimilated and, in the case of blood sugar, we have a similar condition. Carbohydrates may be stored as blood sugar even in excess and, without the means of metabolism in the tissues, they are as much outside the body and as useless to it as they would be were they still in the grape or the grain in their original form.

In cases of hyperglycemia with acidosis, carbohydrates are evidently digested and absorbed but unable to metabolize. In cases of hypoglycemia, glucose is present in insufficient quantities. In the one case, insulin, acting on the intravenous glucose, relieves the condition, and in the other, carbohydrates to supply the deficiency, with insulin to aid in their metabolism, relieve the condition.

As men on the firing line, obstetricians can make use of these facts in the more successful management of these cases while we await the further results of brilliant investigators constantly at work in their efforts to further differentiate and classify these conditions.

I wish to express my thanks to Dr. W. E. Levy for his courtesy in furnishing me the histories of his cases and allowing me to study additional cases at the Touro Infirmary, and to Dr. E. L. King for his assistance in studying the cases at Charity hospital and for putting their records at my disposal for this study.

BIBLIOGRAPHY

1. Duncan and Harding: Can. Med. and Surg. Jour., Dec., 1918.
2. Titus: Jour. Am. Med. Assn., Mar. 20, 1918, Jan. 14, 1922.
3. Thalheimer: Am. Jour. Obst. and Gyn., 9, 673; Surg., Gyn. and Obst., 39, 237; Jour. Am. Med. Assn., 81, 383; 82. 696.
4. Enright: Lancet 198. 314.
5. Maase and Zendek, Ochaten, quoted by Jackson: Inanition and Malnutrition.
6. McCallum: Pathology.
   Rofus: These de Paris, 1887.
   David, Hall and Whipple: Paper III, Ibid. 689.
   Sleman: Am. Jour. Obst., 80, 194.
   Lockhead and Craemer: Proc. Roy. Soc. B., 80, p. 263.
   Mann: Jour. Physiol., 72, 629.
7. Stander and Duncan: Am. Jour. Obst. and Gyn., 10, 823.
8. Stander and Duncan: Bull. Johns Hopkins Hosp., 36. 6.
9. Rowley: Am. Jour. Obst. and Gyn., 5, 23.
10. Williams: Bost. Jour. Med. and Surg., 192, 163.
11. Faber: Hospitalstedende, Nov., 1925.
12. Levy: Surg., Gyn. and Obst. (in press).

TOXICOLOGY OF NICOTIN

A leech sucking blood from a habitual smoker dies in convulsions.

Nicotin is fully as poisonous as cyanid of potassium. Death follows ingestion of a cigar weighing 6 gm. and containing 5 per cent nicotin. It may also follow smoking of 100 cigarettes in one day.

About one-third of the nicotin content of a cigar is present in the smoke, much of it remaining in the last part of the cigar. Moist tobacco is most toxic because its nicotin is not destroyed.

Symptoms traceable to nicotin absorption: Leukoplakia of the tongue; morning vomiting; pylorospasm; cardiospasm; hypersecretion; achylia; meteorism; fetid stools.

Intestinal spasm, with diarrhea and constipation, frequently follow.

Spasm of the sphincter ani may result in hemorrhoidal disturbance. Urticaria and hiccough often accompany.—*From Notes and Abstracts, Johnson and Johnson.*

BALANCED ANESTHESIA*

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In selecting an anesthetic, the average surgical or dental operator will probably be guided by his own past experiences and will choose that agent which has usually produced anesthesia with that amount of relaxation which is most suited to his operative technic. If the average internist chooses the anesthetic it will probably be one which in his experience is the least often associated with untoward postoperative pulmonary complications. If the average anesthetist is made responsible for the choice he has a tendency to employ those agents with which he is most skillful and familiar. If the average patient is permitted to choose he will undoubtedly be guided by his past experiences, if he has had previous operations, or by the advice of friends who have undergone operations; and he would probably recommend the use of preliminary hypnosis to such a degree that preoperative nervousness would be minimized and preoperative injections of local anesthetic made as painless as possible. For inhalation anesthesia the patient would doubtless choose an odorless agent which would induce anesthesia quickly, and he would probably ask that he be rendered totally unconscious. Furthermore, the agents chosen would be those most likely to make for an easy return to consciousness, with as little unpleasantness as possible from postoperative nausea, vomiting, and pain.

Merely to relieve pain at the time of the average operation is not difficult, but the choice of the anesthetic or anesthetics to be employed, and the dosage, should be tempered by moderation, inasmuch as the first consideration of all concerned should be to guard the patient's life. It is generally agreed that circumstances so alter cases that there is no fixed rule or procedure which will provide ideal anesthesia in all cases. I shall discuss, then, how one may safely satisfy the operator, internist, anesthetist, and patient with the anesthetics available at the present time.

*Read before a joint meeting of the St. Paul District Dental Society and the Ramsey County Medical Society, St. Paul, December 10, 1925. Also the Grand Forks District Medical Society, Grand Forks, North Dakota, January 20, 1926. From the Section on Anesthesia, Mayo Clinic.

CONDITIONS GOVERNING CHOICE OF ANESTHETIC

For the purposes of brevity those conditions which permit no choice of anesthetic will not be discussed in detail. Obviously, in an emergency, if nothing but ether is available, there is no choice; or if the anesthetist is capable of administering only ether, there is no choice. Likewise, if the surgeon or his anesthetist has no knowledge of local or regional anesthesia a choice must be made from general anesthetics. In order to permit unhampered choice, either the surgeon or the anesthetist must possess the knowledge and skill requisite to the use of the agents commonly employed in producing the various forms of anesthesia. Since the surgeon cannot operate and give a general anesthetic at the same time, he must necessarily employ an anesthetist. The dentist may employ an assistant and be thereby in a position to administer a general anesthetic and operate as well. Either the surgical or dental operator can, if he will, use local or regional anesthetics. If, for any reason, the operator has not familiarized himself with local or regional anesthesia, he should be able to call in a competent anesthetist. Indeed, there is a very definite need for the anesthetist who can provide, in a given instance, whatever anesthetic is necessary. He should have a knowledge of local and regional anesthesia in addition to his ability to administer the general anesthetics commonly used.

In the last eighty years many anesthetics have been used. Some have been discarded while others have stood the test of time. It is, I think, an undisputed fact, however, that there is no one anesthetic which is entirely satisfactory in all cases when used as a routine. From time to time recommendations have been made that more than one agent be employed at the same time. The champion of any given anesthetic has, of course, worked out a plan which gives him the optimal results of which this particular agent is capable. For example, there are in this country those who use only chloroform or only ether, or a combination of gas and local anesthetic, and some who use local anesthetics only. Each insists that his technic or method is the best. For the last few years there has been a tendency to search for new agents;[6] each investigator eagerly seeks an ideal anesthetic agent and hopes that it will satisfy all the requirements of the operator, internist, anesthetist, and patient. The time may come when such an agent will be

made available; we all eagerly hope to see that day. Nevertheless, until that day arrives it would be well for us to devote sufficient time and attention to the agents already in our hands to enable us to get from them their optimal results.

BALANCED ANESTHESIA

The average healthy man, other things being equal, thrives on a balanced diet. No one food will satisfy all his requirements and yet any one food taken in excess ultimately produces untoward results. The average healthy man is likewise usually able to take into his system a small dose of any of the anesthetic agents commonly used without untoward results, but a very large amount of any of these anesthetic agents ends unpleasantly. It seems logical that a combination of the various agents might be used, each one in small enough amount so that it would produce no unsatisfactory effect; whereas collectively these agents produce diet.

oalanced anesthesia after the fashion of a good

Balanced anesthesia for an average healthy man might be as follows: for an hour or an hour and a half before operation his nervous system is quieted by means of preliminary hypnotics without overdosage; at the time of operation sufficient local anesthetic may be employed either regionally or by infiltration without producing any marked reaction to the drug; nitrous oxid or ethylene anesthesia may next be superimposed on the foundation provided by the preliminary hypnotics and the local anesthesia and not be carried to the point where the patient's natural color changes; to these agents ether may then be added in sufficient quantity to produce the desired relaxation.

It is proposed that anesthesia in this case be produced by the combined effects of a moderate amount of preliminary hypnotic, a moderate amount of local anesthetic, a moderate amount of nitrous oxid or ethylene, and an amount of ether sufficient to obtain the desired result. It is assumed that this person will have very little untoward effect from any one of the anesthetics here employed, but that when combined they will usually produce satisfactory anesthesia.[7]

THE VALUE OF CARBON DIOXID

Recently, 5 per cent carbon dioxid has been advocated as an aid in general anesthesia.[4,5,7,9] It seems to possess many possibilities.[3] For example, much larger doses of morphin can probably be employed preoperatively than heretofore because respiration can be controlled by the administration of a small amount of carbon dioxid with the anesthetic. Carbon dioxid, by deepening the respiration, hastens the rate of absorption of ether.[2] Similarly, at the termination of anesthesia, it hastens the elimination of ether.[5,7,8,9,10] Perhaps, then, carbon dioxid will permit the induction of more profound narcosis with preliminary hypnotics without the danger that their effect on respiration will not be controllable. In other words, 5 per cent carbon dioxid makes safer the use of larger doses of morphin than have ordinarily been used. Carbon dioxid makes for greater safety in the use of oil-ether colonic anesthesia than was heretofore possible, inasmuch as respiratory depression from an overdose of ether by rectum can probably be controlled. Carbon dioxid is especially useful in nitrous oxid or ethylene anesthesia in children,[8] because unreliable respirations have always made gas anesthesia difficult in young children.

In the case of a debilitated patient whose pulmonary condition is questionable one might easily produce deep, relaxing anesthesia by increasing the dosage of the preliminary hypnotic, instilling olive oil and ether into the rectum, injecting local anesthetic into or about the site of operation and inducing light anesthesia with nitrous oxid, or ethylene, with plenty of oxygen and a small amount (1 to 5 per cent) of carbon dioxid. To a stronger patient with sound lungs one could readily give the ether with the nitrous oxid or ethylene by inhalation, depending partly on the morphin for its share in the anesthesia and on the oxygen and carbon dioxid to maintain satisfactory respiration. Carbon dioxid is especially valuable in those cases in which multiple resection of ribs is necessary, as it permits the use of sufficiently large amounts of morphin before operation to reduce coughing, grunting, or cyanosis during operation to a minimum. It is especially valuable when ether is contraindicated and when local anesthesia is refused by the patient or when the imminence of an untoward reaction prevents the use of enough of the local anesthetic to produce all of the required anesthesia.

INDICATIONS FOR LOCAL ANESTHESIA

There are many operative procedures which may be carried out under regional or local anesthesia

without much pain to the patient, especially if there is co-operation by all concerned. Indeed, there are some procedures which should, if possible, be carried out under regional or local anesthesia, and many a nervous patient can be made a good prospect for local anesthesia by the judicious use of preliminary hypnotics in amounts sufficient to eliminate his nervousness. Among those procedures which are highly successful and satisfactory under local anesthesia are the extraction of teeth, operations on the eye, nose and throat and even on the brain, and also herniotomy. Laryngectomy is particularly outstanding as an operation advantageously performed under local or regional anesthesia. Perineal operations, especially hemorrhoidectomy, are facilitated by the use of sacral anesthesia. Operations on or through the adult urinary bladder are more satisfactory in cases in which regional anesthesia has been employed than in those in which it has not been employed, even if it has to be supplemented by light general anesthesia.

INDICATIONS FOR GENERAL ANESTHESIA

General anesthesia, either light or deep, should not be denied to many patients for the extraction of teeth or other work on the head. The average goiter operation is facilitated by the use of a light general anesthetic such as nitrous oxid or ethylene in addition to local. Radical amputations of the breast are probably best performed under general anesthesia. Thoracoplasty can probably be performed as well with morphin, ethylene, carbon dioxid and oxygen, as under any other type of anesthesia. Intra-abdominal operations, especially on the stomach or duodenum, can be successfully performed after the moderate use of a preliminary hypnotic and regional block of the abdominal wall together with ethylene, oxygen, ether and carbon dioxid by inhalation. In operations on the gallbladder the most satisfactory procedure in the average case is probably to depend principally on ether for the production of anesthesia and relaxation. For operative work on nerve trunks, general anesthesia is probably the most satisfactory in the average case. In all these cases the procedures are altered by circumstances. If, for example, a dentist is extremely skillful with local anesthetics and is unused to administering general anesthetics, it is wise for him to employ a local anesthetic; and vice versa. Under ideal conditions he would be ready to use either one in any instance and he would not hesitate to give up one type and turn to another as occasion demanded. The exercise of good judgment in the choice of anesthetic is not limited to the dentist, but could, with profit, be exercised by the surgeon or anesthetist and if he finds himself confronted with a situation wherein a given agent or agents do not produce the desired effect, the use of other or more agents should be unhesitatingly resorted to in order that anesthesia may be produced with as little untoward reaction during and after operation as possible.

The combination of these agents must be varied to satisfy the individual requirements of the patient and his condition. The dose of each agent should be large enough to produce some anesthesia but small enough to produce no untoward effect. In many instances it may be wise to eliminate one or more of them and to produce with the others the necessary effect.

A DANGER SIGN IN GENERAL ANESTHESIA

If the operator observes that the blood is blue or black he can be sure that the anesthetics already in use are not being applied so as to provide safety as well as anesthesia and he should see to it that the technic is altered to provide safety, aëration and anesthesia. If the internist has chosen a mild anesthetic and he observes that by insufficient relaxation, the surgeon is handicapped, no objection should be raised to the addition of a more powerful agent, even though the probability of postoperative complications is increased. It is unfair to the surgeon to expect him to produce good operative results when he cannot obtain adequate exposure. Some surgeons require a great deal more relaxation than others, and if the internist feels that the patient must not have such an agent as ether by inhalation, he should refer him to a surgeon who will be willing to operate without the use of it. During the course of the anesthesia the anesthetist should attempt to keep the patient asleep and the color natural. For the purposes of safety he had better keep the patient's color as pink as possible, whether he keeps him asleep or not. It is, of course, possible to pass through the hazard of momentary cyanosis without great danger, but if cyanosis be prolonged and the blood blue or black it is absurd to expect the heart to continue to provide satisfactory circulation for more than a short time. A vicious cycle is easily established

by continued cyanosis, wherein respiration becomes insufficient, the blood becomes blue or black, and the heartbeats become weaker and weaker because of the progressive decrease in the available oxygen; thus lack of oxygn depresses the circulation, and deficient circulation diminishes oxidation. Ultimately the point is reached where circulation is insufficient to aërate the tissues even when pure oxygen is administered. The anesthetist should avoid cyanosis, and if it develops quickly in a patient and there is difficulty in keeping the color pink, even though 20 per cent or more of oxygen is being used, some degree of cardiac failure should be suspected. The question should be settled as quickly as possible so that operation may be postponed or quickly ended and the patient thereby safeguarded. The patient should not try to select both the type of anesthesia and the surgeon, but rather he should, after making his selection of the operator, give him every opportunity to do the necessary work in the manner most likely to result in a cure of his disease, even if there be some unpleasant experiences from the use of the anesthetic. The judgment of operator, internist, anesthetist and patient should be flexible. The operator should be open to suggestion, the internist must permit all possible relaxation of the patient, the anesthetist should try to induce anesthesia with satisfactory aëration and with as nearly as possible that amount of relaxation which he knows the operator desires; and the patient, when he chooses his surgeon, must realize that he has also chosen the type of anesthesia. Teamwork on the part of each of the participants should result in a maximum of safety and effective anesthesia.

PRELIMINARY HYPNOTICS

There is a variety of plans advocated in the use of the auxiliary drugs at the present time. Each advocate has probably had good and sufficient reasons for insisting, for instance, that morphin or adrenalin be or be not used. Personally, I believe that a patient who is unsuitable for local anesthesia may frequently be rendered suitable by the judicious use of hypnotics in amounts sufficient to quiet him without jeopardizing his safety. I also feel that a moderate amount of morphin is not contraindicated in those cases in which carbon dioxid can be given with the anesthetics. At the same time, for purposes of safety, it is probably inadvisable to give morphin indiscriminately to patients who are to have ether by the open drop method. An even, smooth anesthesia by the open drop method cannot be carried on with safety in every instance unless one has available the pupillary signs to warn of an overdose. Under most circumstances it is probably best to give the morphin sufficiently early so that its effects can be fairly well gauged before anesthesia is started. The dental operator, without sufficient retiring rooms for patients, probably does well to use no preliminary hypnotic, but those whose custom it is to admit their patients to the hospital are not thus handicapped in the use of hypnotics. The use of morphin with magnesium sulphate has been advocated, and if the sterility of the solution can be relied on and if the injections are always intramuscular it probably has more virtues than are generally recognized.[1] Preliminary hypnosis is usually indicated for nitrous oxid or ethylene anesthesia in the case of vigorous adults for most surgical procedures; it is, however, not a necessity in dental operations.

LOCAL INFILTRATION ANESTHESIA

Anesthesia produced by infiltration of the tissue to be incised is widely used by both general and dental surgeons. It has certain advantages: (1) the anesthetic agent may be used in dilute solution and thus cause very few drug reactions, (2) anesthesia is quickly induced and injection quickly and easily, and almost painlessly, done, and (3) it provides some hemostasis, especially if epinephrin is also being combined with it. Infiltration anesthesia also has certain disadvantages: (1) it provides little relaxation, (2) infection and delayed healing may result, (3) the operative field is distorted, and (4) it is accused of causing postoperative hemorrhage in some cases. This method is widely used and other advantages and disadvantages have been pointed out by many.

REGIONAL ANESTHESIA

The use of regional anesthesia is becoming more and more widespread. It has certain recommendations, chief among which are: (1) anesthesia and relaxation are produced, (2) the injection being at a distant point does not affect healing or infection of the wound, (3) the tissues in the operative field are not distorted by the fluid injected, and (4) it is not responsible for postoperative hemorrhage. Regional anesthesia has certain disadvantages: (1) reactions occur after the sometimes difficult and painful injection of an excessive quan-

tity of concentrated solution, (2) the production of anesthesia is frequently slow, (3) little artificial hemostasis is produced.

Infiltration and regional anesthesia have much to recommend them both. For example, operation for hernia is as well performed under infiltration anesthesia as under regional, while for extraction of teeth or the operations of hemorrhoidectomy and circumcision, regional anesthesia seems best suited.

DOSAGE OF NOVOCAIN AND EPINEPHRIN

The question of the dosage of novocain is frequently raised. Since the answer must state facts concerning the concentration and amount of solution, the time consumed for its injection and the condition, size and age of the patient, I shall, for purposes of brevity, attempt to express it in the form of an equation, which in a general way in regional anesthesia indicates the dose without untoward reaction thus:

$$\frac{CA}{RT} = \text{dose of novocain without untoward reaction}$$

In this formula C means concentration; A means the amount of solution; R means the time consumed for the injection of the solution; T represents the patient's tolerance for the drug under the circumstances surrounding its use in the given instance. The degree of tolerance is estimated on a basis of 1:4, wherein T^1 means a low tolerance, T^{2+} means the average tolerance and T^4 means a very high tolerance.

Tolerance is estimated largely by the age, weight, blood pressure and pulse rate. It varies indirectly with the variation from adult age, which may be taken to lie, in general, between twenty-five and fifty. The greater the variation from that age, the lower the tolerance. It varies directly with the weight, whether the patient is of normal development or overweight. Normal blood pressure and pulse rate indicate average tolerance; the greater the variation in these factors, the lower the tolerance. Tolerance is therefore a function of these four factors, or

$$T = f\left\{\frac{\text{Weight}}{\text{V. age, V. blood pressure, V. pulse rate}}\right\}$$

where V. indicates variation from the optimal.

For example:

$$T^1 = \frac{100 \text{ lbs.}}{60 \;.\; 110/60 \;.\; 96}$$

$$T^{2+} = \frac{150 \text{ lbs.}}{40 \;.\; 120/80 \;.\; 72}$$

$$T^4 = \frac{200 \text{ lbs.}}{30 \;.\; 130/85 \;.\; 64}$$

From this formula the tolerance is estimated at the beginning of the injection. If untoward results occur, the explanation may be found in several causes. Rough handling or pain may be responsible either directly or indirectly. The shock to persons susceptible to pain may be sufficient to lower the tolerance to the drugs injected; or the apprehension aroused by the anesthetist's lack of skill may lead to evidence of intolerance. In many cases the injection could be continued under light anesthesia without any reaction, and tolerance is often raised by the substitution of a more skillful and confident anesthetist. Sudden untoward reactions usually are the result of direct injection into a blood vessel.

Besides these cases of explainable lowered tolerance, there is a small number in which there is no reason for the subnormal tolerance. The general robustness of the patient, his usual occupation, the actual tangible disease he is suffering from, and the functional abnormality that cannot be estimated and that may not amount to any known disease, all have some influence on tolerance.

The formula is provisional; it serves as a guide at the outset, and in most cases can be followed throughout, if the injection is made carefully and skillfully. The reaction to the first few cubic centimeters is the test of its accuracy; if that is untoward, the formula must be altered.

The relative dosage of various solutions can also be compared by the equation:

$$\frac{CA}{RT} = \frac{C'A'}{R'T'}.$$

Untoward reactions may be avoided by the slow injection of the anesthetic, provided the needle has

been properly placed. The following equations are examples of the circumstances under which an injection would probably produce anesthesia without untoward reactions:

$$\frac{1\% \cdot 100 \text{ c.c.}}{\frac{1}{2} \text{ hr.} \cdot T^{2+}} = \frac{0.5\% \cdot 200 \text{ c.c.}}{\frac{1}{4} \text{ hr.} \cdot T^{1+}} = \frac{0.5\% \cdot 200 \text{ c.c.}}{\frac{1}{2} \text{ hr.} \cdot T^{1}} = \frac{2\% \cdot 50 \text{ c.c.}}{\frac{1}{2} \text{ hr.} \cdot T^{3}} = \frac{2\% \cdot 40 \text{ c.c.}}{\frac{1}{2} \text{ hr.} \cdot T^{2+}} =$$

$$\frac{0.5\% \cdot 500 \text{ c.c.}}{\frac{1}{2} \text{ hr.} \cdot T^{3+}} = \frac{0.5\% \cdot 300 \text{ c.c.}}{\frac{1}{2} \text{ hr.} \cdot T^{2+}} = \frac{2\% \cdot 7 \text{ c.c.}}{1/12 \text{ hr.} \cdot T^{2+}}$$

The degree of untoward reactions to novocain varies directly with the rate of absorption of the drug. It is obvious, therefore, that if one could use 100 c.c. of 1 per cent novocain solution in a given instance, he could not ordinarily use more than 40 c.c. of 2 per cent solution, while he might use as much as 300 c.c. of 0.5 per cent solution.

Epinephrin is generally believed to prolong the local anesthetic action of drugs such as novocain. There are certain conditions in which its use is contraindicated, for example, in patients with exophthalmic goiter. The dental operator must be most careful in the use of epinephrin, since it is usually in concentrated form when he uses it; that is, he will add one or two drops of a strong solution of epinephrin to 1 or 2 c.c. of the solution of the local anesthetic to be injected. The reaction is sometimes untoward and occasionally very severe. Surgeons and anesthetists who add epinephrin to their local anesthetic solutions occasionally meet a patient who apparently has an idiosyncrasy to the epinephrin, or too much of the agent may be given. Personally, I use about five minims of a 1:1000 solution of adrenalin chlorid to each 100 c.c. of novocain solution, regardless of the strength of the novocain solution, unless I think it is contraindicated either by the patient's general condition or by an untoward reaction following the injection of the first part of the solution. Probably the most satisfactory way to add epinephrin is from sterile ampules.

CONCLUSIONS

Balanced anesthesia is more practicable for the general surgeon than for the dental surgeon unless the operative procedure be time-consuming. Again, circumstances determine the procedure, but wherever balanced anesthesia can be induced it probably comes closer to satisfying the operator, internist, anesthetist and patient than any one agent can, if used as a routine.

BIBLIOGRAPHY

1. Gwathmey, J. T.: Anesthesia. 2 ed. New York, Macmillan, 1924, 732-750.
2. Haggard, H. W.: The absorption, distribution, and elimination of ethyl ether. Jour. Biol. Chem., 1924, lix, 753-770.
3. Henderson, Yandell: Resuscitation. Jour. Am. Med. Assn., 1924, lxxxiii, 758-763.
4. Henderson, Yandell, and Scarbrough, M. M.: Acapnia and shock. VI. Acapnia as a factor in the dangers of anesthesia. Am. Jour. Physiol., 1910, xxvi, 260-286.
5. Henderson, Yandell, Haggard, H. W., and Coburn, R. C.: The therapeutic use of carbon dioxid after anesthesia and operation. Jour. Am. Med. Assn., 1920, lxxiv, 783-786.
6. Luckhardt, A. B., and Carter, J. B.: Ethylene as a gas anesthetic. Preliminary communication. Jour. Am. Med. Assn., 1923, lxxx, 1440-1442.
7. Lundy, J. S.: Ordinary ethylene-oxygen administration. Jour. Iowa State Med. Soc., 1925, xv, 371-373.
8. Lundy, J. S.: Anesthesia by nitrous oxid, ethylene, carbon dioxid, and oxygen for dental operations on children. Dental Cosmos, 1925, lxvii, 906-909.
9. Lundy, J. S.: Carbon dioxid as an aid in general anesthesia. (Jour. Am. Med. Assn., 1926, lxxxv, 1953.
10. White, J. C.: De-etherization by means of carbon dioxid inhalations. Arch. Surg., 1923, vii, 347-370.

TRUDEAU, THE SCIENTIST*

AN APPRECIATION

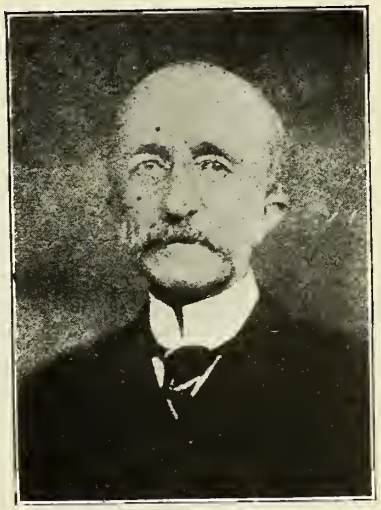
WALTER J. MARCLEY, M.D.

Minneapolis

We in Minnesota may claim a special interest in the life and work of Edward Livingston Trudeau, because it was to our state that he was sent in the early '70s to regain his health. At that time the climate of Minnesota was reputed to be of special benefit to tuberculous invalids. He remained during the winter, living with Mrs. Trudeau at the Windsor Hotel in St. Paul, at that time the leading hotel of the young city. Many years subsequently, he told me of this experience: of the very agreeable hospitality of our neighbors of those days, of the outdoor sports in which he took an active part, and that in the spring he was no better than in the previous autumn. We do not wonder, in the light of present knowledge regarding the treatment, that he did not improve. This was before the teachings of Brehmer and Dettweiler had made any impression on the medical profession of this country and when rest was not deemed an essential in the cure.

Throughout the length and breadth of this country and abroad, Trudeau was known not only as a pioneer in the sanatorium treatment, but also as a scientific investigator in tuberculosis. It is with his scientific achievements in investigation that I wish especially to deal in this sketch.

Today, with our well equipped laboratories, with the heritage of the many successes and failures of the investigators who have gone before, we cannot realize the difficulties that confronted this pioneer in scientific research—difficulties which he later expressed as follows: "No health, no scientific training, no apparatus, no access to books, situated 42 miles from a railroad, in a primitive forest where I had gone in search of health." Equipped only with a microscope, in this remote region and alone, he began his investigations. Trudeau had a vision and he labored unceasingly with an optimism and enthusiasm born of an immortal spirit. A friend sent him an English translation of Koch's paper on the Etiology of Tuberculosis. He converted a small room in his house into a laboratory and, having learned to stain the bacillus from Dr. Prudden in New York, he began at once to grow cultures in a home-made apparatus heated by a kerosene lamp. He was the second observer in this country to grow the bacillus in pure cultures. He then repeated all of Koch's inoculation experiments. He was obliged to keep his guinea pigs in a hole in the ground heated by a kerosene lamp for, as he said, that was the only spot in Saranac Lake where they would not freeze.



Edward L. Trudeau

Later, while ill in New York City, the kerosene lamp in the little laboratory exploded during the night and his house was burned to the ground. The next day a patient called upon him and offered a gift of money for the erection and equipment of the very complete laboratory we know today. It is a fireproof structure of cut stone, slate, glazed brick and steel and is completely furnished with every appliance for bacteriological and chemical work. It was built in 1894 and is the first laboratory to be established as a separate institution in this country devoted exclusively to research in tuberculosis. While the new laboratory was in course of construction, a small addition to his stable was built, and there he carried on his investigations for a year.

His first publication was in 1885, in which he recorded his experiments demonstrating the infectiousness of bacillary sputum and the harmlessness of expectoration free from bacilli taken from a patient supposed to have tuberculosis.

The following year he made his well-known investigation on the influence of environment upon the progress of the disease. The results of this

*Read before the Minnesota Trudeau Medical Society at Minneapolis, February 23, 1926.

experiment were published in the American Journal of Medical Sciences in July, 1887. He placed one lot of rabbits, which had been inoculated, in a cellar away from light and air. They all died of tuberculosis. Another lot not inoculated were placed in a dark hole in the ground and fed a small daily ration through a trap door at the top. At the end of four months they were all living and showed no signs of tuberculosis. Another lot were inoculated and allowed to run wild on an island and were provided with ample food. One of this lot of five died of tuberculosis. The others, at the end of four months, were caught only by the aid of a gun. They were found to be in splendid physical condition and showed no signs of tuberculosis. From this investigation he concluded that "environment is a potent factor in determining the future type and even the final results of the disease and the effect of extremes of environment on the resisting power of the cells of the body is an element in this complex problem which should not be ignored."



The first home of the Saranac laboratory, in the little wing on the left of Dr. Trudeau's house under the small half window.

He tested out by animal experimentation the various specific methods of treatment and vaunted "consumption cures" that were put out from time to time. Many experiments were carried on to test the value of these germicidal substances. He learned that the bacillus bore a degree of medication that proved fatal to the host and that creosote, iodoform, sulphureted hydrogen, hydrofluoric acid, essence of peppermint, and all other germicides proposed as cures, had no influence on the tuberculous process and often shortened the lives of the tested animals. He demonstrated that hot air inhalation, a method of specific treatment put forth by various observers, did not prevent the growth of the tubercle bacillus in the lungs or diminish the virulence of this organism. Of creosote, that time-honored medication in tuberculosis, he said, over thirty years ago, "It is my experience in animal tuberculosis that no matter how large the doses of creosote injected, the disease develops regularly in its natural course. It seems to me that in phthisis it does good in improving the condition of the stomach and intestinal canal, but if it disagrees with the stomach it should be omitted. It is in no sense a specific."

The most of his work was devoted to attempts to produce an artificial immunity. In 1890 he wrote "the most promise at present seems to lie in the study of nature's laws of immunity and in learning how far we may influence and imitate it." He speaks of immunity to disease as "a part of the unseen riddle of life itself" and says, "An exact knowledge of nature's laws as yet escapes us." The story of his persistent search after the truth hidden away in the mystery of life is a fascinating tale of adventure. Natural physical vigor, he said, was no doubt a prominent element in the mechanism of immunity and yet not the only element; for many people in the vigor of life frequently succumb to acute tuberculosis in a short time, while many apparently weakened individuals living amid unfavorable conditions never develop the disease. He believed that the margin between immunity and susceptibility was a very narrow one at first, and that some slight biological or chemical variation in the tissues was capable of turning the balance in favor of or against infection. As acquired immunity was established naturally by a previous attack, he sought to produce an artificial immunity by some form of inoculation.



The Saranac laboratory.

His studies relative to the methods of growth and the varied pathogenic properties of the bacillus, the differences in virulence of his various cultures and the characteristics of the lesions produced in animals, brought out the existence of various strains of the bacillus. Subcutaneous preventive inoculations of the avian bacillus in attenuated cultures were found to have a definite abortive influence upon an otherwise progressively fatal process in the eye of rabbits subsequently injected with cultures of Koch's bacillus. Non-living chemical products of the bacillus failed to produce any protection.

He obtained by prolonged growth a culture which was not fatal to rabbits in the majority of cases, and only relatively so to guinea pigs. When these animals were reinoculated with virulent bacilli, guinea pigs thus protected lived four times as long as the controls. Apparently, some influence had been produced by the preventive inoculation and the peculiar reaction to the test inoculation was apparently due to a certain degree of artificial immunity. He believed the introduction of living bacilli was necessary to the production of relative immunity, and stated in 1894 that his observations and those of other investigators point toward the possibility of obtaining at least a "relative degree of artificial immunity." During the remaining years of his life this belief was unchanged.

During the week that Koch's discovery of tuberculin and his hopes of its specific curative action was announced in this country and created in the medical profession an excitement which up to that time had never been equalled, Trudeau published in the Medical Record (November 22, 1890) an article describing his attempts to produce an artificial immunity by injections of sterilized filtered liquid cultures of the tubercle bacillus (his own tuberculin) and his failure to produce any degree of immunity by this method.

Baldwin went to Saranac in 1892 to regain his health and from that time took an active part in Trudeau's work; and in the new laboratory, under the inspiration of the master, carried on many independent investigations. In his autobiography, Trudeau says of Dr. Baldwin, "Through many long years of friendly fellowship, through many long years of work side by side, through many long years of physical misery and suffering, my debt to Dr. Baldwin has steadily grown, until it has become a debt which I can never hope to repay but by affection and gratitude; a coin in which many debts, I find, are paid to him, because it is a coin he cannot possibly refuse to accept." And later, he adds, "I learned to lean more and more on him until the time came when I finally turned this branch of my work over to him entirely."

Trudeau and Baldwin attempted to produce a serum from asses, calves, sheep and rabbits in which they could demonstrate an antitoxin. I



Dr. Trudeau, the investigator, 1894.

recall that at the time of my first visit to Saranac, Trudeau showed me his guinea pigs which had been treated with the serum of an ass and whose lives had been prolonged several months by this method. With his usual optimism he hoped they were on the track of a definite curative substance. Two years later they published the results of these investigations covering a period of four years. They concluded that neither their serum nor others proposed by other experimenters were able to save the tuberculous guinea pig from a fatal dose of tuberculosis or tuberculin.

When Koch published his paper on T.R., Trudeau and Baldwin, with the true spirit of the investigator, tested out this new tuberculin on animals and found in it living tubercle bacilli capable of infecting guinea pigs. The publication of their findings, no doubt, prevented the harmful results which would have come from the employment of this preparation in an unsterile form.

The tuberculin test and the mechanism of the reaction was the subject of many studies at the laboratory. Trudeau demonstrated that Koch's tuberculin did not cure experimental tuberculosis in guinea pigs, although it had a specific influence

on the primary lesion. He showed that the liquid culture medium in which tubercle bacilli had developed and from which they had been removed by filtration contained the elements which produced the reaction, and he pointed out that the focal reaction was essential to the cure.

During all the years of experimentation, the results obtained in the laboratory were employed in developing and perfecting the treatment of the disease in the Sanatorium.

When Koch proposed the use of tuberculin therapeutically in 1890, Trudeau began to use it at the institution. In his address before the Henry Phipps Institute in 1903, he presented his results of treatment with tuberculin, showing a definite benefit obtained as indicated by a comparison between the treated and the untreated cases. A group of treated minimal cases studied from the viewpoint of ultimate results showed 76.7 per cent living and well from two to thirteen years after discharge, as compared with a similar group of untreated cases showing 61 per cent. Four years later, in an article appearing in the American Journal of Medical Sciences, he sets forth the method of employing tuberculin, and gives his impression of its benefits in properly selected cases. His opinion is expressed in these words, "We have much to learn about tuberculin treatment, but even in the present state of our knowledge I am inclined to think that the production of tuberculin immunity by the mild clinical method is capable of favorably influencing the course of chronic tuberculosis, of prolonging life, and in many cases, of aborting a commencing infection or extinguishing the smouldering fires of a chronic infection."

I believe the succeeding years, with the development of improved technic in diagnosis and treatment, have not shown his opinion of 1907 to have been erroneous. I commend this article to those of you who are interested in this therapy.

In all of his publications Trudeau gave full credit to the men who were working with him or carrying on independent investigation: to Baldwin, Hewetson, Hance, Levene, Wilder, Kinghorn, Krause, Brown, and the others, all of whom felt the spell of his personality and the spur to achieve of his enthusiasm.

He referred with much appreciation to the exhaustive studies made by Baldwin and Levene on the chemistry of the tubercle bacillus. They separated a fat or wax-like substance which made up 30 per cent of the body substance of the bacillus and showed that it was this wax-like substance that holds the stain. They also separated three nucleo-proteids and a glycogen-like substance and from the nucleo-proteids obtained nucleic acid. The nucleo-proteids were shown to be the toxic element. This was twenty-five years ago. In the light of subsequent investigations on this subject in the various laboratories of the world, these studies of the pioneer investigators at Saranac assume a significance and importance of first magnitude.

As a clinician Trudeau emphasized the great importance of the early diagnosis of the disease. He pointed out twenty-five years ago that 60 per cent of the cases applying for admission to the sanatorium were advanced cases. In this connection he said, "From my own experience I foresee that although the open-air method and sanatorium regime have given renewed hope in the treatment of this fatal malady, the results obtained in the many institutions now projected or already built will be disappointing unless the all-important bearing of early diagnosis is more generally realized."

In January, 1916, two months after he had passed away, there appeared in the British Journal of Tuberculosis an article submitted by Trudeau entitled, "Relative Immunity in Tuberculosis and the Use of Tuberculin." The purpose of this article was to correct a wrong impression of his views which had appeared in a previous issue of the Journal. This writing comes to us almost as a message from the Beyond and affirms his beliefs in relative immunity and tuberculin. "Nothing has occurred to diminish my faith in the value of tuberculin treatment," he wrote, "but I see no reason why continued research should not in time give us a better sensitizer than tuberculin." "I believe thoroughly in relative immunity in tuberculosis," and he adds, "but this relative protection is not a real immunity but an increased resistance to superinfection." He expresses his faith "in the possibilities of chemotherapy for tuberculosis," and states his faith is based on "what Ehrlich has demonstrated as possible in syphilis." And he ends with these words, "I see no reason why what has been accomplished in the treatment of syphilis should not be attained in tuberculosis, and such an agent, when properly used, would prove of great value in the treatment of this disease."

He was greatly interested in the development

of the *x*-ray as a means of diagnosis. When I last visited him at Saranac in 1914, he spoke with great enthusiasm of the work in the *x*-ray laboratory at the sanatorium under Brown, Heise and Sampson. Artificial pneumothorax claimed his attention and approval. He used his influence to develop sanitary and preventive measures in and about Saranac Lake, thus demonstrating his interest in the Public Health phase of the tuberculosis problem.

Trudeau was indeed a true scientist. With a fine mind always open to the new revelation, with an inexhaustible store of optimism, with a keen look ahead, he sought untiringly to disclose the truths of nature, never definitely stating a fact until he had ample proof for substantiating it, and reporting from year to year his progress and his own developing beliefs.

To those of us who knew Trudeau in his lifetime, the great charm of his personality and his constant friendliness ever remain as a cherished memory. His indomitable courage, his buoyant spirit, his scientific achievements are an inspiration to us all in this our newly-organized society and will spur us on to achieve, even in a feeble way, something worth while in an attempt to make our society worthy of his great name.

CHIROPRACTORS PAY $120 PER YEAR ANNUAL DUES

The fact that a few physicians throughout the state have protested against the payment of approximately ten dollars per year in the shape of dues in order to carry on the activities of the Illinois State Medical Society prompts us to mention the fact that a band of chiropractors in the state pay as dues the sum of one hundred and twenty dollars ($120) per year or ten times the amount paid by members of the regular medical profession. By comparison this makes the doctors belonging to the regular school look like pikers.

We are reliably informed that at the close of the last session of the legislature some of the leaders of the chiropractor legislative committee openly boasted that the chiropractors had in their treasury upwards of $150,000 that they intended to use in putting over a chiropractic bill at the forthcoming session of the legislature; that Illinois is a pivotal state from the chiropractic standpoint, that it is just across the river from the great chiropractic school at Davenport, Iowa, and that they must have the chiropractic law in Illinois. We accept all these statements as gospel truth as viewed from a chiropractic standpoint and repeat that when it comes to raising money to carry on activities of a state medical organization the members of the medical profession are only pikers.—*Illinois M. J.*, March, 1926.

More and more we are suggesting state medicine or the socialization of medicine in one form or another as the solution of the difficulties. This is the suggestion of Mayer and Harrison of the General Education Board. Dr. E. P. Lyon, dean of the medical department of the University of Minnesota, at the Conference on Medical Education, 1925, said in substance, "Suppose we do get socialization of medicine, what of it? I am a state employe and I find that status satisfactory." One of the great objections to socialism is that employes find the status satisfactory. The socialization of medicine would mean that the medical profession would be in the position of the public school teachers.—*Pusey A. M. A. Jour.*, May 15, 1926.

THE THERAPEUTIC USE OF OXYGEN

There is a rational basis for the administration of oxygen in certain conditions, but it does not consist in the exhibition of a few whiffs of the gas through a funnel held in front of a patient's face. Ordinarily, the inspired air contains approximately 21 per cent of oxygen. It requires a decided increment of the latter in the air intake to produce effective gains by diffusion through the lungs into the pulmonary capillaries. To be of therapeutic potency, oxygen should be administered at an optimal concentration, which has lately been proposed at 40 per cent of the inspired air. Apparatus has been developed which insures the inspiration of the high concentrations of oxygen which is desired. (Jour. A. M. A., May 8, 1926, p. 1455.)

"MAN"

Man can't sleep out of doors without freezing to death or getting rheumatism; he can't keep his nose under water over a minute without being drowned. He's the poorest, clumsiest excuse of all creatures that inhabit the earth.

He has to be coddled, swathed and bandaged to be able to live at all. He is a rickety sort of thing any way you take him—a regular British Museum of inferiorities.

He is always undergoing repairs. A machine as unreliable as he is would have no market.

The lower animals appear to us to get their teeth without pain or inconvenience; man's come through after months of cruel torture, at a time when he is least able to bear it. As soon as he gets them they must be pulled out again. The second set will last for a while, but he will never get a set that he can depend upon until the dentist makes one.

Man starts in as a child, and lives on diseases to the end as a regular diet. He has mumps, scarlet fever, whooping cough, croup, tonsilitis, and diphtheria, as a matter of course.

Afterwards, as he goes along, his life continues to be threatened at every turn by colds, coughs, asthma, bronchitis, quinsy, consumption, yellow fever, blindness, influenza, carbuncles, pneumonia, softening of the brain, and a thousand other maladies of one sort or another.

He's just a basketful of pestilent corruption, provided

for the support and entertainment of microbes. Look at the workmanship of him in some particulars:

What's his appendix for? It has no value. Its sole interest is to lie and wait for a stray grape seed and breed trouble.

What is his beard for? It is just a nuisance. All nations persecute it with a razor. Nature, however, always keeps him supplied with it, instead of putting it on his head.

A man wants to keep his hair. It is a graceful ornament, a comfort, the best protection against the weather, and he prizes it above emeralds and rubies, and half the time nature puts it on so it won't stay.

Man isn't even handsome, and as for style, look at the Bengal tiger—that ideal of grace, physical perfection and majesty. Think of the lion, the tiger and the leopard, then think of man, that poor thing. The animal of the wig, the ear trumpet, the glass eye, the porcelain teeth, the wooden leg, the silver windpipe, a creature that is mended all from top to bottom.—*Mark Twain.*

EXAMINING BOARDS FOR THE BASIC SCIENCES

Two states, Wisconsin and Connecticut, have established examining boards in the basic sciences composed, in each instance, of three laymen, none of whom shall be a teacher, or shall hold a degree in any of the so-called healing arts. In Wisconsin the basic sciences include anatomy, physiology, pathology and diagnosis, while in Connecticut the subject of hygiene is added. This represents a new feature in medical legislation, and we are fortunate to be able to publish the article of Prof. M. F. Guyer, Ph.D., of Wisconsin in the April number, and that of Dr. Robert L. Rowley of Connecticut in this issue, describing the work of these new examining boards.

The underlying purpose is to determine the fundamental qualifications of applicants for the practice of any of the healing arts. There may be some difference of opinion as to what constitutes fundamental knowledge necessary for admission to the more advanced technical or professional examination. Naturally, the question arises whether this can best be accomplished by a board composed of non-medical examiners. It certainly places a large responsibility on the appointing body, but the careful selection of personnel in the two boards mentioned gives assurance that the plan will work out well.

The members of these boards will probably function very little as actual examiners, since they are permitted to select experts in the different subjects to conduct the several examinations. It is also unlikely that practitioners from any of the cults or other limited forms of practice will be called on for this purpose. Furthermore, applicants who are able to pass the required examinations will be confined largely to those who have been trained in a well organized medical school. These boards will therefore act more as a sifting agency, and instead of being a backward step it is distinctly a forward movement and will certainly advance the standards of education as well as of practice.

A bill creating a similar board for the basic sciences was passed by the Washington State Legislature, but was vetoed by the governor. The senate passed the bill over the governor's veto, and it failed in the house by only a few votes. The sentiment in favor of this type of qualifying board is evidently extending to other states.—*Federation Bulletin*, May, 1926.

MINNESOTA MEDICINE

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EDITORIAL

The Trudeau Medical Society of Minnesota

A paper on the life and work of Dr. E. L. Trudeau and his professional achievements in the interest of the consumptive and the scientific understanding of his malady, by Dr. Walter J. Marcley, appears in this number of MINNESOTA MEDICINE.

This paper was read at a recent meeting of a new association of workers in the tuberculosis field, who have named their society in honor of this pioneer in sanatorium work in North America.

Minnesota is not the only state with an organization of tuberculosis workers who have emblazoned the name of Trudeau upon their banner. Michigan preceded Minnesota and Illinois followed her in organizing a Trudeau Medical Society among their respective tuberculosis workers. These associations not only register an appreciation of Dr. Trudeau, but also emphasize a renewed activity and greater interest in the ranks of tuberculosis men everywhere.

Many members of the profession will wonder at this. The customary attitude towards tuberculosis is well illustrated by the experience of a physician, who, being obliged to enter a sanatorium as a patient, eventually regaining his health, joined the staff of a sanatorium. He discovered greatly to his amazement that the work was not uninteresting and as dry as dust, but was very much alive, charged with the magnetic attraction of many unsolved problems, and rewarded with the satisfaction that always attends successful achievement. For example, tuberculosis, formerly known as captain of the forces of death, headed mortality returns since they were first made, but in the last decade it has been sunk to the sixth place in New York state and will probably be found there or even lower when the next United States census returns are made for the entire nation. Some fourteen years ago the tuberculosis mortality in Minnesota was about 120 deaths per hundred thousand living. In 1925 it was less than 62 per hundred thousand living, which result is due to a great extent to the very liberal supply of beds for the consumptive in Minnesota's tuberculosis sanatoria, which now exceed theoretical requirements by over 33 per cent. This requirement has been defined as being one bed for each annual death. With our two thousand beds and a total mortality of about fifteen hundred, Minnesota is one of the few states that have exceeded the requirements in this regard.

The one piece of work that is lacking is to supply Minnesota with a working colony, along the lines of Wisconsin's Tomahawk Lake Camp, where patients discharged from state or county sanatoria could go to be gradually hardened and made fit to return safely to a hard working and unsympathetic environment in a busy world. Such a colony would quickly relieve the overfilled condition of our public sanatoria and round out the requirements of our tuberculous population.

The remarkable fall in tuberculosis mortality is due to many factors. Public health is a purchasable commodity and this reduction has been paid for by a number of agencies. It has been paid for by the sale of Christmas seals, conducted by the National Tuberculosis Association, which in 1925 alone amounted to nearly five millions of dollars. It has been paid for by the devoted work of many women and men, in and out of the profession of

medicine, who have secured the provision of some seventy thousand beds for consumptives in these United States. It has been paid for by the enforcement of the anti-spitting laws, by the child welfare movement, by the tuberculin-tested herds of cattle, by the open-air school rooms, by the summer camps, by the preventoria for exposed children, by the sleeping porch, by the wide distribution of hygienic knowledge through the circulation of such journals as Outdoor Life, Hygeia, Northwestern Health Journal and many others.

On the purely professional side of the question we have the diagnostically and therapeutically invaluable tuberculin of Koch and its many variations, the marvels of roentgenology in diagnosis and treatment, the artificial pneumothorax, introduced in America by Dr. John B. Murphy, and its logical consequence, extrapleural thoracoplasty and phrenecotomy, together with the marvelous and as yet unexplained results of heliotherapy and of the various types of lamps. Each of these recent additions to the armamentarium of the tuberculosis worker has opened up new fields for the research worker.

The absorbing interest in the life of the professional tuberculosis worker can be readily grasped by this short review of some of the important subjects that he is interested in and certainly explains the appearance within a short time in the Mississippi Valley of three Trudeau State Medical Societies.

H. L. T.

The High Cost of Dying

In every profession or calling are to be found unscrupulous individuals who, with mercenary ends in view, bring discredit to their calling. The undertaker is peculiarly in a position to take advantage of his clients and it has become only too apparent that too many of them are guilty of gross overcharging.

The near relative of the deceased is as a rule absolutely ignorant of what constitutes fair charges by undertakers for either materials or services. There exists a natural repugnance at the thought of bargaining over these matters and the idea of economy at such a time is distasteful. Such an attitude might be construed as a reflection on the departed one. This feeling is particularly conspicuous in certain foreign elements in our population. The funeral must be of great proportions and the larger the cortege the better.

Recent disclosures have led some life insurance companies to refuse assignments of life insurance policies to undertakers. The practice on the part of certain undertakers of inducing widows to spend in some instances most of the insurance money on the burial of the departed one led to this action by the insurance companies. The chief offenders seem to have been the smaller establishments, which care for the very poor. Undertakers' bills have been fitted according to the amount of life insurance left rather than to the circumstances of the family.

According to Patterson, in a recent article in the New York World, caskets wholesaling at $25 to $30 sold for $200 to $300, and more pretentious ones in proportion. Other items appear at five or ten times the cost. Automobiles usually renting at $5 an hour are charged at the rate of $10 to $12. He estimates that from one-third to one-half the burial bill in New York City of approximately $15,000,000 is made up of unclassified items known as "gravy" to the unethical members of the calling.

It does seem strange that a 15-cent shave should cost $5 after you are dead, or that you should have to pay the price of an automobile for a box to lie in underground.

The result is, of course, that many undertakers carry on their books thousands of dollars in accounts that never will be paid. The conscientious citizen is, under such circumstances, the goat.

The physician has little to do with undertakers. He is likely to avoid when possible the chance meeting in the hospital corridor and that shake of the hand which, somehow, seems to infer so much. He has to see him at times at his office but seldom keeps him waiting long in the reception room. One never heard of a partnership between two members of the two professions.

The physician, however, if he were better acquainted with the undertakers of his community would be in a position to direct individuals to reliable members of that very necessary calling. This would serve to lessen some of the evils referred to.

Physicians and Charity

Criticism is voiced from time to time of professional men—lawyers, physicians and dentists—in the matter of their contributions to organized charities. We cannot speak authoritatively for lawyers and dentists but a word about the relation of the physician to charities such as the Community Chest might serve to explain what may seem lack of generosity on the part of our profession.

No profession has more opportunities for giving services free to those unable to pay than the medical profession, unless it be the clergy. The majority of physicians contribute more or less of their services to worthy individuals who cannot afford the burdensome expense of physicians' fees. It is impossible to state exactly what percentage of the profession extends this free service. We all know many confrères who do and we also know a few who we suspect do not. This free service is in addition to the many instances when fees are cut below what is generally considered a fair charge. The numerous free clinics such as city hospitals, dispensaries, maternal and infant welfare clinics where physicians receive no monetary remuneration are in addition to this entirely gratuitous service.

The impression is rather general that all physicians are well-to-do. The occasional large fees paid by wealthy individuals only adds to this impression. There is no denying that the average physician makes a better living than the general average. This should be true if medicine is to attract the highest type of youth and maintain a high average personnel. The expense of practicing medicine has increased to such an extent that the average physician finds his net income none too abundant.

After all, charity is an entirely personal matter. The idea of the fair distribution of public subscriptions by such methods as the Community Chest is a fine one and it is not our intention to say anything in any way disparaging to chest campaigns. It would be most unfortunate, nevertheless, if the rank and file of our profession were to limit their charity to donations to organized charities and ignore the opportunities for personal giving in instances where the need is obvious.

We realize that we are emphasizing a side of medical practice which in modesty we perhaps should not mention. Our purpose as much as anything else is to encourage the practice.

COMMUNICATIONS

Duluth, Minn., June 1, 1926.

To the Editor:

Enclosed you will find a copy of a letter which I have just written to the Professional Press, Chicago, and which is largely self-explanatory. In the interest of right, I wish you would give that letter, as well as this, early publication in MINNESOTA MEDICINE.

Very fraternally yours,
T. H. SHASTID, M.D.

The Professional Press, Inc., June 1, 1926.
17 North Wabash Ave.,
Chicago, Illinois.

Gentlemen:

In your "Blue Book" for 1926, I have just noticed, with much amazement, the unwarranted insertion of my name as that of an optometrist, also as that of a member of the "Kindly Optical Co.," of this city. "Kindly" I take to be a mistake for "Kindy," as there is no "Kindly Optical Co." here. Inasmuch as I have never in my life been an optometrist or a member of the Kindy, or any other, optical company, I take it much amiss that you should thus have inserted my name, or have inserted it at all, without the slightest warrant on my part for so doing.

I also notice, in the same edition of your "Blue Book," that, in the "Alphabetical Index," p. 434, you have "Shastiel, T. H., Superior, Wis." As there is no person by the name of "Shastiel" in this city, I take it that "Shastiel, T. H.," is intended for "Shastid, T. H."

Though I have no quarrel with optometrists or opticians, I will thank you to leave my name out of your "Blue Book" hereafter, further not to represent me at any time as being a member of a business firm in which I have never had the slightest interest, financial or otherwise.

Yours truly, T. H. SHASTID, M.D.

OBITUARY

DR. W. M. SWENEY

Dr. William Montgomery Sweney, city health officer and oldest resident of Red Wing, Minnesota, died Tuesday, June 1, following an illness of several weeks with Bright's disease. He was 77 years old, and had lived in Red Wing since a child.

Dr. Sweney served for several years as city health officer, and was widely known as the father of Red Wing's pure water supply. Red Wing's water, for years, was taken direct from the Mississippi river, but as a result of a campaign waged by Dr. Sweney, artesian wells were drilled, providing the city with pure water.

Dr. Sweney practised medicine in Red Wing for 50 years. Having lived in Red Wing in pioneer days, he early acquired a love of nature, resulting in exhaustive studies in archeology and geology, in both of which he was a thorough student and able writer.

His wife and four children, James H. and Edward B., both of Minneapolis; Mrs. J. H. Douglas, of Roseton, Sask., and William, located in northern Minnesota, survive.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

NORTHERN MINNESOTA MEDICAL ASSOCIATION

The annual meeting of the Northern Minnesota Medical Association will be held Monday and Tuesday, August 9 and 10, 1926, at Crookston, Minnesota.

Twenty scientific papers will be presented and five clinics will be given.

Speakers at the banquet, Monday evening, will include Dr. O. J. Hagen, Moorhead, Minn.; Dr. Morris Fishbein, Chicago, Ill., and Dr. Arnold Schwyzer, St. Paul, Minn.

PROGRAM

1. Dr. Hilding Berglund, Minneapolis, Minn.—"Constipation."
2. Dr. John Fulton, St. Paul, Minn.—"Lenticular Opacities."
3. Dr. H. P. Ritchie, St. Paul, Minn.—"Congenital Cleft Palate and Lip: The Four Operations."
4. Dr. Ivar Sivertsen, Minneapolis, Minn.—"Surgery of the Spleen."
5. Dr. Arthur Hamilton, Minneapolis, Minn.—"Diagnosis and Treatment of Epilepsy and Migraine."
6. Dr. W. S. Lemon, Rochester, Minn.—"A Clinical Survey of Bronchiectasis."
7. Dr. W. E. Sistrunk, Rochester, Minn.—"The Management of Goiter."
8. Dr. L. A. Buie, Rochester, Minn.—"The Diagnosis and Treatment of Rectal and Anal Diseases Applied to General Practice."
9. Dr. Gage Clement, Duluth—"Indications for Physiotherapy."
10. Dr. T. L. Chapman, Duluth, Minn.—"The Advantages of Local Anesthesia in Thyroid Surgery."
11. Dr. F. F. Callahan, Pine City, Minn.—"Diagnostic and Prognostic Significance of Serous Pleural Effusion."
12. Dr. J. F. Norman, Crookston, Minn.—"Intestinal Obstruction."
13. Dr. J. A. Lepak, St. Paul, Minn.—"Hodgkin's Disease in the Future."
14. Dr. E. Z. Shapiro, Duluth, Minn.—"Pathology in the Urinary Apparatus."
15. Dr. R. G. Allison, Minneapolis, Minn.—"The *X*-ray Characteristics of Certain Types of Mediastinal and Pulmonary Diseases."
16. Dr. B. S. Adams, Hibbing, Minn.—"Procrastination in Surgery."
17. Dr. T. A. Peppard, Minneapolis, Minn.—"Postpneumonic Atelectasis."
18. Dr. J. H. Moore, Grand Forks, N. D.—"Pain Relief in Childbirth."
19. Dr. W. C. Nichols, Fargo, N. D.—"Certain Phases of Myocardial Degeneration."
20. Dr. C. B. Wright, Minneapolis, Minn.

CLINICS

Tuesday Morning, August 10, 1926

1. Dr. Hilding Berglund, Minneapolis, Minn.—Internal Medicine.
2. Dr. Carl Larson, St. Paul, Minn.—Eye, Ear, Nose and Throat Diseases.
3. Dr. F. W. Schlutz, Minneapolis, Minn.—Pediatrics.
4. Dr. E. L. Tuohy, Duluth, Minn., and Dr. H. L. Ulrich, Minneapolis, Minn.—Internal Medicine.
5. Dr. Arnold Schwyzer, St. Paul, Minn.—Surgery.

MONTANA STATE MEDICAL ASSOCIATION

The Montana State Medical Association will meet July 16 and 17, 1926, at Billings. In addition to papers by the members of the association the following visitors will take part in the program: Drs. W. J. Mayo, D. C. Balfour and A. U. Desjardins of Rochester, Minn.; L. W. Fox of Philadelphia; R. C. Coffey of Portland, Ore.; Fred. L. Adair, F. C. Rodda of Minneapolis; A. B. Dunn of Hastings, Nebraska; Henry Schmitz of Mercy Hospital, Chicago, and Morris Fishbein, editor of the A. M. A. Journal, Chicago.

The commercial exhibit promises to be one of the very best ever staged in the West and every effort is being made to provide for entertainment of visitors.

The Montana Health Association will meet in Billings the two days preceding the State Medical meeting. On July 15 the Montana Academy of Eye, Ear, Nose and Throat will meet and clinics will be presented by Dr. L. Webster Fox of Philadelphia.

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

At the forty-fourth semi-annual meeting of the Southwestern Minnesota Medical Society, held at Pipestone, Minnesota, Thursday, May 6, 1926, the following program was presented:

President's Address. Dr. H. C. Doms, Slayton.

"Intestinal Obstruction and Dilatation Due to Accident. Relieved by Operation. Exhibition of Patient." Dr. A. H. Brown, Pipestone.

"Exhibition of a Case of Banti's Disease." Dr. E. G. McKeown, Pipestone.

Case Report. Dr. H. DeBoer, Edgerton.

"Hyperemesis Gravidarum." Dr. L. A. Williams, Slayton.

"Diathermia." Dr. W. S. Hitchings, Lakefield.

"Head Injuries." Dr. F. M. Manson, Worthington.

"Rural Obstetrics and a Comparative Study of Its Relation to Puerperal Mortality Statistics." Dr. Wm. A. Piper, Mountain Lake.

After the scientific program members of the Society and guests were entertained at dinner at the Ashton Memorial Hospital.

MID-WESTERN ASSOCIATION OF ANESTHETISTS

The annual meeting of the Mid-Western Association of Anesthetists will be held in Kansas City, Missouri, October 11 to 14, 1926, at the same time as the Kansas City Clinic Week. Headquarters will be at the Baltimore Hotel.

Plans for an interesting and attractive program are in the process of completion. Announcement is made that any physician or dentist desiring to read a paper should send the title to the secretary, Dr. Ralph M. Water, 425 Argyle Bldg., Kansas City, Missouri.

OF GENERAL INTEREST

Dr. F. M. Dryden, formerly of Crookston, is now located in Lamanda Park, California.

Dr. C. A. Hallberg, recently of the Mayo Clinic, Rochester, has announced the opening of offices in the Donaldson Building, Minneapolis.

Dr. O. V. Opheim recently completed a year's course in surgery at the Graduate School of Medicine, University of Pennsylvania, Philadelphia, and has resumed his practice at Starbuck, Minn.

Dr. J. C. Rohwer, formerly of the Mayo Clinic, Rochester, is now associated with the Manhattan State Hospital, Wards Island, New York.

Dr. E. G. Adams has moved from Ah-Gwah-Ching, Minn., to Decatur, Ill., where he is associated with the Decatur and Macon County Hospital.

Dr. A. J. Button has moved his practice from Hackensack, Minn., to Greenbush, Minn.

Dr. R. D. Benson of Minneapolis is now located at Sidney, Montana.

Dr. J. J. Ahlfs, formerly of Bemidji, Minn., has moved to Bismarck, N. D.

Dr. W. J. Dowswell has disposed of his practice at Benson and is now practicing at Little Falls, Minn.

Dr. Morris Levine has been promoted to the position of associate professor of otology at the New York Post Graduate Medical School and Hospital, Brooklyn.

Dr. A. S. Hoiland, Minneapolis, has announced the removal of his offices to the Donaldson Building, where he is practicing his specialty, eye, ear, nose and throat work.

Prior to 1915 the Minnesota State Board of Health acted as distributor of diphtheria antitoxin, each county paying for its antitoxin supply for the indigent of the county. In 1915 a state appropriation of $5,000 per annum became available and distributing centers were established throughout the state. The appropriation has been increased from time to time, in 1925 being $15,000. Some 360 distributing stations have been established and no restrictions are placed on the use of the antitoxin except that physicians must report on every package issued to them.

Dr. A. J. Chesley, executive of the State Board of Health, took part in the Annual Conference of Health Officers and Public Health Nurses held at Lansing, Michigan, in June. He also took part in the Annual Conference of Health Commissioners of Ohio, which was held in Columbus.

Announcement has been received of the marriage of Miss Esther Westman, daughter of Mrs. Charles Westman, and Dr. Hamline A. Mattson, which occurred Friday, June 18, at Cannon Falls, Minn.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

HOFFMANN-LAROCHE CHEMICAL WORKS:

Isacen

SCHERING & GLATZ:

Digitalis Dispert

Digitalis Dispert Tablets, 0.08 Gm.

SWAN-MYERS CO.:

Iodeikon Capsules-Swan-Myers

TRUTH ABOUT MEDICINES

Pituitary Body Anterior Lobe Desiccated-Mulford.—The anterior lobe of the pituitary body of cattle, separated, dried and powdered. For a discussion of the actions, uses and dosage, see Pituitary Gland, New and Non-official Remedies, 1925, p. 260. This product is also supplied in 2½-grain and 5-grain tablets. H. K. Mulford Co., Philadelphia.

Sterile Solution of Anterior Lobe Pituitary Extract-Mulford.—An extract of the anterior lobe of the pituitary body of cattle. Each c.c. represents the extractive of 0.2 gm. of fresh substance. For a discussion of the actions and uses, see Pituitary Gland, New and Non-official Remedies, 1925, p. 260. The preparation is marketed in 1 c.c. ampules. H. K. Mulford Co., Philadelphia.

Pituitary Solution Surgical-Wilson.—An extract of the posterior lobe of the pituitary body of cattle. It is standardized to have twice the strength of solution of pituitary, U.S.P. For a discussion of the actions, uses and dosage, see Pituitary Gland, New and Non-official Remedies, 1925, p. 260. This preparation is marketed in 1 c.c. ampules. Wilson Laboratories, Chicago.

Scarlet Fever Streptococcus Antitoxin Concentrated.—A scarlet fever streptococcus antitoxin (Jour. A. M. A., May 2, 1925, p. 1338) prepared according to the method of Drs. Dick by license of the Scarlet Fever Committee, Inc.

This antitoxin is marketed in packages of one syringe containing 7 c.c. (prophylactic dose) and in packages of one syringe containing 14 c.c. (therapeutic dose). H. K. Mulford Co., Philadelphia.

PROPAGANDA FOR REFORM

Bismuth Compounds in Antisyphilitic Therapy. — The usefulness of bismuth in the treatment of syphilis seems to be assured, but there is pressing need of dependable evidence as to the sort of compounds of the element that are most likely to prove useful. In a study sponsored by the Therapeutic Research Committee of the Council on Phar-

MAIL DIRECTORY INFORMATION CARD PROMPTLY

During the month of June, every physician in the State should have received a Directory information card. Every one is urged to fill out and return the stamped card regardless of whether he or she has changed their residence or office address.

This information will be used in compiling the Tenth Edition of the *American Medical Directory*, now under revision in the Biographical Department of the American Medical Association. The Directory is one of the altruistic efforts of the Association and is published in the interest of the medical profession, which means ultimately in the interest of the public. It is a book of dependable data concerning the physicians and hospitals in the United States and Canada.

macy and Chemistry, Cole, Farmer and Miskdjian have demonstrated anew that the administration of suspensions of finely divided metallic bismuth is inadvisable because such preparations remain unabsorbed for long periods. This warns against the danger of cumulative action of a toxic substance. The study did not bear out the contention of some writers that insoluble salts of bismuth must be injected twice weekly to obtain a gradual, even absorption of the metal. If bismuth salicylate and potassium bismuth tartrate are injected intragluteally once a week they are not likely to give rise to cumulative action, but patients should be observed closely. When suitable preparations are cautiously employed, undesirable complications can for the most part be avoided. Cole regards bismuth as a valuable drug in the treatment of syphilis, but he urges a conservative attitude until more evidence as to the precise effect of the drug is available. (Jour. A. M. A., May 1. 1926, p. 1352.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of April 14, 1926

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, April 14, 1926, at 8 P. M.

The meeting was called to order by the President, Dr. H. L. Ulrich. There were 27 members and 2 visitors present.

The minutes of the March meeting were read and approved.

The following members reported cases:

Dr. A. A. Law (Minneapolis) reported a case of "Ventral Tumor of the Sacrum," with moving pictures of the operation.

Tumors posterior to the sacrum are not uncommon and are easily explained, by realizing that coalescence between cutaneous surfaces in the lines of fetal inclusions may pinch off tissue which ultimately may give rise to the simpler dermoids.

Tumors on the ventral aspect of the sacrum are not so readily and easily explained. Tumors in this region may be one of three types—a true dermoid cyst, the teratomata, or the mixed tumor. Other tumors in this region are unusual.

We are indebted to Middledorf for an explanation of this type of tumor which appears in the sacrococcygeal region. He has shown how early in the life of the embryo the entoderm forms the caudal intestine, the canal dorsalis and the chorda dorsalis; the mesoderm, the connective tissue, muscles, vertebra and blood vessels; and the ectoderm the primitive streak, the medullary tube and its vestiges. It has been well shown how the central canal of the spinal cord and the primitive alimentary canal remain patent and communicate around the caudal extremity of the notochord. This patent passage is called the neurenteric canal. Later in the life cycle of the fetus the proctoderm, invaginating to form the cloacal chamber, perforates the gut in front of and above the neurenteric canal opening. When these early fetal canals close, a part of the gut is left behind. With development of the fetus the postanal gut becomes obliterated, as does the neurenteric canal. Middledorf believes, and his belief is accepted, that these congenital tumors occurring in this region can be explained by the growth of the vestiges of the postanal gut and neurenteric canal. This explanation is logical when we consider that some of these tumors must have their origin from all three of the primary fetal layers.

There has been another theory advanced by Adami to explain the preponderance of these peculiar tumors. He believes that the mammal has the same growing points accredited to plants and believes these growing points start at the base of the brain and in the sacral region. He believes that when the nervous system completes its development the growing points stop. He contends, however, that under some exciting stimulus the growth may continue and affirms that the cells have the property of reproducing the three primary germinal layers. Whether or not his contention is correct, pathologists do not tell us. Most of these tumors in the ventral region of the sacrum are definitely encapsulated. They spring from the connective tissue in front of the sacrum and are readily shelled out. They sometimes are attached rather intimately to the ventral side of the sacrum.

Only thirty cases have been reported to date in the literature. Six cases of the rare chordoma are to be found in the literature. These apparently rise from anlage of the notochord. Eighty per cent of them have been reported malignant. It has been generally considered that ventral sacral tumors are relatively benign, yet a study of the literature indicates that they are so frequently malignant that all of them should be removed. Two of my cases, one reported in 1912 and the other in 1922, had both local and metastatic recurrences. Both patients were autopsied and the recurrences confirmed. Parin collected six cases reported to be malignant, and Pringle, Fowler and Lund have reported local and metastatic recurrences. This makes eleven of the thirty cases reported which were malignant.

The case I have to report at the present time was that of a young married woman, aged 38, whose preliminary history is of little significance. She has had three children, the youngest eleven months of age. She was aborted ten weeks ago. Her menstrual period has been normal. The last period was February 5, 1926. For the last eleven months she has complained of pain in the sacral region which radiates to the back of the right leg. For the past three weeks she has had pain on urination and dribbling of the urine with difficulty in starting her urine. Her stools have always been well-formed and not ribbon-like. She has had no loss of weight.

She entered the hospital on March 3, 1926. Examination (both vaginal and rectal) revealed a mass the size of a grapefruit in the hollow of the sacrum. This was fixed, hard and firmly attached outside of the rectum and was not a part of the adnexa. Laboratory studies were entirely negative. Urine, blood and metabolics were negative. The patient was operated upon March 5, and discharged from the hospital on April 5.

The operation which is shown in the "movie" which I propose to show tonight reveals the approach of the tumor through the post-sacral region, the removal of the coccyx

and the lower part of the sacrum. The tumor was opened and drained of sebaceous material, after which its removal was readily accomplished. Sections of this tumor by Dr. O'Brien, University of Minnesota, reveal it to be a cyst of the anterior sacral region with chronic inflammation of the wall. The tissue shows microscopically connective tissue fibres, marked diffuse infiltration with lymphocytes and a small amount of hemorrhage at one end. There is a cross section of a large nerve and the blood vessels are large and thick-walled. No epithelium can be made out.

This is one of the simpler types of cysts in the ventral sacral region which, in this instance, we believe is entirely benign.

Dr. S. E. Sweitzer (Minneapolis) presented a patient with Madura Foot, and gave a report of the case:

Madura Foot is a term used to describe a swelling and clubbing of the foot frequently seen on the feet of natives of Madura, India.

The term was introduced by Colebrook in 1846. Vandyke Carter, in 1860, designated the condition as mycetoma. It is a chronic infectious disease due to a fungus infection and characterized by swelling of the part with subsequent disintegration of the subcutaneous structures and the formation of sinuses. These sinuses discharge grains which are black, red, or white. The disease is endemic in certain parts of India, and cases have been reported from Italy, Africa, the Philippines, South and Central America, Mexico and the United States.

Recent articles by Boyd & Crutchfield, Pagenstecher, Lovejoy & Hammack, and Gammel have covered the subject most thoroughly. Gammel et al., in the most recent article, reported the twenty-first case in the United States. Their case was of the black-grain variety and was the second case of that variety reported in North America. This case is then the twenty-second in the United States and the third of the black-grain variety, as black grains were freely found in this case.

Etiology: The mycetomas can be divided into antinomycoses and maduromycoses. The actinomycoses include those in which the grains are composed of thin non-septate filaments without chlamydospores. They may be produced by thirteen different species of the actinomyces. The maduromycoses are characterized by grains formed by thick septate mycelial filaments with definite walls and frequently forming chlamydospores. They may be subdivided according to the color of the granules. Nineteen different organisms have been described as causing maduromycoses.

We see then that the same clinical appearance can be caused by many different organisms. There is frequently a history of injury to the foot, as many of the patients go barefooted and suffer slight abrasions of the skin.

The following case of Madura Foot is reported from the General Hospital, Minneapolis, and is the first case of this disease reported in Minnesota.

H. J., colored, age 39, admitted to the hospital because of swelling of the foot with purulent discharge. The patient dates his trouble to 1914, when he was working in Texas as a farm laborer. The large toe of the right foot was crushed between two planks. The toe swelled up and then went back to normal size in a few days. The toe felt "dead" until about two years later, when feeling began to return. About the same time the patient noticed a little hard lump under the skin on the dorsum of the great toe. This lump very slowly increased in size. The patient noticed no discharge until two years ago. Since that time he has had an intermittent discharge of pus from several openings in the skin.

X-ray showed slight evidence of destruction in the distal end of the proximal phalanx of the great toe; no evidence of bone production. Bone destruction is probably due to pressure from soft tissue enlargement.

By puncturing the closed sinuses, thick creamy pus mixed with some blood was obtained. In this pus were several black sandy grains of various sizes and irregular shapes. The crushed grains on slide, soaked in 20 per cent sodium hydroxide, under oil immersion, showed branching mycelia resembling thrush fungi. These mycelia appeared very faintly within the reddish-brown background of the granule. Granules, washed in saline and planted on solid media, grew very slowly, showing powder-puff appearance, grayish in color.

Dr. J. F. Hammond (St. Paul) reported a case, and showed specimen, of a hair ball removed from the stomach of a little girl 9 years old.

A girl, 9 years old, was first seen by me on March 4, 1926. At that time she had what looked like an influenza.



Fig. 1. *X*-ray taken immediately after barium meal showing filling defect in the stomach in the region of marker placed near lower border of the palpable tumor. (Hammond.)

She always had been a nervous, delicate child. She had had recurring attacks of vomiting, possibly once a month or oftener from the time she was three years old, but no particular pain. It was noticed from the age of about 2½ years that during excitement she would twist her hair about her finger; then to release her finger she would jerk it away, taking the hair along with it. She would then remove the hair from her finger by biting it off.

What the mother was most anxious about was the attacks

of vomiting. It was decided to investigate this when she had recovered from the acute infection.

On March 20, 1926, the child was brought to the office. She was fairly well-nourished, rather pale, weight 72½ pounds. The chest was negative. Abdominal examination revealed no tenderness. There was a mass which reached



Fig. 2. *X*-ray taken 22 hours after barium meal showing retention of barium in the meshes of the hair ball. (Hammond.)

as low as the umbilicus and extended from the left costal margin to the right of the umbilicus. It moved freely with respiration, had a sharp edge, and was not tender. It was first thought to be an enlargement of the left lobe of the liver.

Barium was given and watched with the fluoroscope. The barium could be seen working around the mass in the stomach, taking some time to get to the bottom. Palpation under observation with the fluoroscope made it quite evident that the tumor was in the stomach. Examination six hours after the barium meal showed marked retention, but the barium was not confined to the bottom of the stomach; it was caught in the meshes of the mass. The accompanying picture (Fig. 2), taken 22 hours after the barium was given, shows this very well.

On April 8, 1926, the patient was operated upon and a mass of hair removed from the stomach. It weighed 5.75 ounces, and measured 5.5 x 3 inches. At operation, after the patient was under the anesthetic, the tumor disappeared, slipping up under the costal margin, for the first time while she was under observation.

The abdomen was opened by a left rectus incision. The mass was reached with some difficulty; it was found high up under the costal margin and to the left in the cardiac end of the stomach. An opening was made in the anterior wall of the stomach by transverse incision and the tumor delivered. It appeared to be adherent, requiring considerable traction. The mucosa was more or less reddened and injected.

The stomach and abdomen were closed in the usual way.

April 13, 1926, the patient is making a satisfactory recovery.

DISCUSSION

Dr. E. S. Judd (Rochester): We have seen two of these hair balls in the stomach, though they are not common; one some years back, and the other one just a little while ago. They were in adults; both balls were larger and had been present quite a little longer than in this case.

Dr. H. P. Ritchie (St. Paul): I think that picture is quite worthy of intimate study. About twenty years ago I saw a picture similar to this in one of the eastern clinics. The case was quite carefully followed at the time. When I saw this picture I recalled the other case, and said this was hair-ball.

Dr. Oscar Owre (Minneapolis) reported a case of pelvic tumor found in a male who has just recovered from prostatectomy.

I wish to report briefly quite an unusual and extraordinary pathological entity I found in a patient who had just recovered from a prostatectomy. The prostate was removed successfully and the patient made an uneventful recovery. Six weeks after operation he developed an excruciating pain in the left lower quadrant of the abdomen, the temperature at one time running to 106°, with chills. He came back to the Swedish Hospital. On catheterization we found no residual urine. The urine was clear with a few leucocytes in it. Upon cystoscopic examination the left kidney showed no secretion and it was impossible to introduce the catheter into the left ureter. We *x*-rayed the patient and found this peculiar picture. There is a stone in the lower



Fig. 3. Photograph of hair ball removed. (Hammond.)

portion of the ureter. Then in attempting still further to introduce the ureteral catheter, it passes the stone and, instead of going up to the left kidney, it passes across laterally to the opposite side of the pelvis at a distance of 6.5 centimeters to this point (shown on *x*-ray plate). At this stage of the examination we aspirated the ureteral

catheter and removed 4.5 ounces of thick purulent urine. A pyelogram was made and the following *x*-ray picture was taken, and we found we had a pelvic kidney. His temperature dropped, but so far he has not allowed me to take out the pelvic kidney.

Dr. A. Schwyzer (St. Paul) reported two cases, as follows:

1. Blue Gallstones. Several gallstones were shown. The largest one among them shows an extraordinary feature in that it is blue. The question is, what is it due to? There is a case known where an absolutely blue stone, made of indigo, was found in the kidney. Indigo must come from indican, which is a glucosid of indigo. Indican originates from intestinal putrefaction, *i.e.*, where we have a coli infection. We might have had coli infection here in the gallbladder, which gave us the indigo. Indigo forms sometimes in the body; for instance, sweat under the arms may be blue; it is one form of chromidrosis, and the substance which gives this bluish color is indigo. I do not know if blue gallstones are described anywhere in the literature, but have not had a chance to look this up closely. The stone is not all blue; only one layer of it is blue; the other part of it, and all the other stones, are yellowish brownish.

2. Hydrocephalus. This is a case of a baby five weeks old, referred to me by Dr. Rosenholz. It was a high forceps delivery. Soon after birth the child started to have signs of hydrocephalus and the head increased in size rather rapidly. The greater fontanelle is very large and there is a large membranous communication with the lesser fontanelle, about 2 cm. in width. The lesser fontanelle also is widely open. The child had not gained any in weight and was even losing weight rapidly, as projectile vomiting had set in. We thought it was necessary to interfere surgically.

A sagittal incision was made just back of the coronary line and about 2 cm. to the side of the midline. A small opening made into the dura allowed us to insert a female catheter, which followed the falx downward and penetrated the corpus callosum. Out came clear fluid, which had distinctly been under pressure, while twice before a spinal puncture had only yielded one or two drops of fluid. After about half an ounce of clear fluid had escaped, the opening in the catheter was held closed. After a little while another half ounce was allowed to escape. The child was kept all the time in a half-sitting posture. We then withdraw the catheter in order to thread it with catgut, which was to be left for drainage. As it was too soft, we inserted a kangaroo tendon through the catheter into the ventricle and pushed the outer end of it under the galea. The skin was then closed. This was done on April 9.

About two days later we noticed, when the child was taken up, that there was a splashing noise in the head, and in shaking the head it was made clear that air had entered. It was thought advisable to make use of this occurrence for ventriculograms in order to see if the brain was normally formed and to get a possible further information as to the cause of the hydrocephalus. From the *x*-ray pictures we can see that the configuration of the brain appears normal. (Several *x*-ray pictures were shown.) The lateral ventricles were well outlined, proving that both foramina of Monro were patent. On taking a picture with the head down, the air was seen to have gone through the aqueduct of Sylvius into the great cisterna. Considering the fact that Dr. Rosenholz got hardly any fluid by repeated spinal punctures, the pathology in all probability is therefore right here at the foramen magnum, consisting of a closure of the communication between the cisterna magna and the spinal subarachnoid spaces and also those of the brain surface.

I am glad to say that the child has picked up nicely, has not vomited any more, and has started to gain.

DISCUSSION

Dr. W. A. Jones (Minneapolis): Dr. Schwyzer's report of this case recalls to my mind a man who was under my observation twenty years ago. He was about forty years old at the time, and was a man who was highly cultured, spoke several languages, and was considered an expert accountant. He was well built, but had a chronic hydrocephalic head. During a typhoid epidemic which was prevalent in Minneapolis at that time he died from the fever, and on account of his hydrocephalus we secured a postmortem. Our findings were rather amazing. He had a mere shell of cortex and the interior was practically filled with fluid; that is, there was no delineation of ventricles and the basal ganglia were in their proper place at the bottom of the cavity. There must have been some fibrous parts from the cortex down through the shell of the brain to connect with the spinal cord and other mechanisms. This man was not in any way warped as to his mentality and yet he had an unusual pathological hydrocephalus.

It seems, therefore, safe to conclude that a man may go on his way or do and accomplish unusual things with very little brain substance; that so long as he keeps his gray matter intact and it connects with other and deeper segments in the brain and the spinal cord, it seems to make but little difference how much fluid his brain contains.

Dr. F. W. Schlutz (Minneapolis): The case Dr. Schwyzer reported, I saw the sixth day after birth. The child had vomited a good deal and had not had fluids. The picture presented at that time was one of extreme dehydration. The head was very small, the fontanelle was very much sunken, and the child was in a stupor. That was the most pronounced symptom at this time. The size of the head seemed rather below normal. I can recall there was a factor in the case which pointed to a constitutional phase. The parents denied specific trouble. A previous child had died. I think that birth occurred about five or six years before this baby was born. There was some element in the case that worried the parents a good deal, but I do not recall now just what it was.

Dr. A. C. Strachauer (Minneapolis): On account of the very free communication between the ventricles as demonstrated in Dr. Schwyzer's case, I should feel that prognosis was extremely good.

About seven years ago Dr. Midelfart, of Eau Claire, brought me a case of hydrocephalus in a baby six or seven months old. I operated upon the child as described by Dr. Schwyzer, but using the Cushing aspirating probe instead of the catheter used by Dr. Schwyzer. Reports have been received at frequent intervals from the child's parents,

and within the past year Dr. Midelfart wrote me that the child, now nearly eight years old, walks two miles to school each day and is developing normally, both physically and mentally.

Dr. Schwyzer (in closing): I only want to add that when it comes to activity of the brain and mental power, a moderate hydrocephalus does not signify inferiority. Astronomers, physicists and mathematicians have had the largest and heaviest brains. One of the greatest physicists that Germany ever had was Helmholtz, and he had a very outspoken hydrocephalus when he was a child.

This puncture of the corpus callosum is really a very simple thing.

Dr. A. C. Strachauer (Minneapolis) reported a case of Complete Laryngectomy for Intrinsic Carcinoma of the Larynx, and showed the patient.

Chas. B., age 57 years, had complained of a progressive, painless hoarseness of eight months' duration.

Laryngoscopic examination disclosed a lesion involving the right vocal cord, giving the characteristic cord fixation.



Case of complete laryngectomy. The tracheotomy opening is underneath the collar. (Strachauer.)

His history, physical and laboratory findings were otherwise unimportant. The clinical diagnosis was confirmed by a biopsy which showed the lesion to be a squamous-celled carcinoma.

A three-stage complete laryngectomy, following the Crile technic, was performed as follows: On January 2, under ether anesthesia, the larynx and upper trachea were exposed and skeletonized after dividing the isthmus of the thyroid gland and by freeing the attachment to the esophagus posteriorly. One week later, on January 9, under local anesthesia, a tracheotomy was performed. On January 20, under ether anesthesia administered through the tracheotomy tube, the larynx was completely removed and the opening in the hypopharynx closed by two superimposed suture lines.

Several days before the last stage of the laryngectomy, a duodenal tube was placed so that the patient would become accustomed to its presence and to duodenal feedings.

Convalescence was uneventful and the patient has made a perfect recovery.

Carcinomata of the larynx are classified as (1) Intrinsic, when below the level of the true vocal cords in the subglottic zone; and (2) Extrinsic, when above the level of the true vocal cords in the supraglottic zone.

Intrinsic carcinoma manifests itself by chronic progressive hoarseness, and may be recognized early on laryngoscopic examinations. It is one of the most curable of cancers if treated early and radically, giving cures in 65 to 70 per cent of the cases (MacKenty). While the larynx is placed deep in the neck the lesion is, nevertheless, a surface lesion and in this respect compares favorably with skin cancer. The lymphatics of the vocal cords are scanty and the cartilaginous walls of the larynx are extremely resistant to malignant permeation, thus constituting a barrier to extension and confining the lesion.

Patients who have had total laryngectomy performed live comfortably, work, eat, smoke, whisper audibly, and some of them learn to swallow air which on eructation permits them to speak audibly. Some patients are able to talk over the telephone and count from one up to twenty on one stomachful of air. There are several types of artificial larynx; one, devised by Dr. J. E. MacKenty, with rubber vocal cords, is quite satisfactory in producing phonation.

The one-stage operation is performed by a few operators, but the majority of surgeons, led by Crile, carry out the several-stage technic, which has a lower mortality and the following advantages: (1) The magnitude of the operation is divided; (2) by skeletonizing the larynx and trachea and packing off the tissues of the neck, Nature establishes a granulation tissue barrier to the extension of infection into the mediastinum after the trachea is opened. This infection in the mediastinum has been one of the principal causes of death; (3) the preliminary tracheotomy results in fixation of the trachea before its division, thus preventing its moving up and down on inspiration and expiration, giving a pump-like action which sucks infection into the mediastinum; (4) in the final stage of the operation the patient may be etherized through a rubber tube which snugly fits into the tracheal opening, thus preventing the entrance of blood and mucus into the trachea and thereby protecting the patient from pulmonary infection and pneumonia, which, again, have been large factors in the postoperative mortality.

In the past, radium has been of value only as a means of palliation in hopeless cases. Recent developments in the use of radium in these cases offer hope of improvement, but the results, as yet, are not established.

(2) Dr. Strachauer demonstrated an instrument which he had devised for the introduction of radium emanation seeds into the substance of malignant tumors.

Twenty or thirty of these seeds frequently are imbedded in a tumor and, according to the present technic, are placed in a hollow needle and deposited with a stylet, one at a time.

Dr. Strachauer's instrument is devised on the principle of the repeating rifle, with a magazine containing thirty seeds. The needle is introduced into the substance of the malignant lesion and the entire contents of the magazine are ready for depositing, one at a time, without removal of the instrument. This results in the infliction of less trauma and in more even distribution of the seeds throughout the lesion, since the orientation is not lost, as happens in the removal and reintroduction of the single needles as commonly practiced.

Radium was first used as a surface application. Later, in certain types of lesions, radium element in suitable containers, needle in form, were introduced into the tissues. This is termed the intratumoral application. Since the action of radium on tissues is always through the medium of its emanation, Duane, while working in Paris, suggested its imbedding in capillary glass tubing cut in short lengths and termed seeds. This method was further developed by Janeway and has been extensively used at the Memorial Hospital in New York City. Due to the more even distribution of the radium throughout the tumor mass this method gives greatly improved results, notably in intraoral cancer.

Radium and the emanation both give off alpha, beta and gamma rays. The alpha ray is an extremely short ray and is filtered out by even a thin layer of paper and is practically negligible. The beta ray is an extremely caustic ray and is responsible for necrosis and sloughing of tissues. The gamma ray corresponds to the therapeutic *x*-ray wave, and is the desirable therapy ray. Glass capillary seeds filtered out the alpha ray but not the caustic beta ray; therefore, Dr. Failla, physicist at the Cancer Memorial Hospital, New York, suggested the use of gold capillary tubes, instead of glass, which gold would filter out the undesirable beta ray.

Dr. Strachauer's instrument is devised for the imbedding of the gold capillary tubes containing radium emanation. These tubes are deposited throughout the tissues of the lesion; one tube containing one millicurie of emanation, which is the equivalent of one milligram of the radium element, being imbedded to each one cubic centimeter of tissue. The action of the emanation continues over a period of about five and a half days, after which the small gold tube remains encysted in the tissue and becomes absolutely innocuous.

Dr. H. P. Ritchie (St. Paul) showed lantern slides of a case of skin grafting over the hip after the leg had been amputated.

Dr. H. L. Ulrich (Minneapolis) showed *x*-rays of an enormously dilated esophagus in a patient who had had cardiospasm for about thirty years.

Dr. E. T. F. Richards (St. Paul) gave the paper of the evening, entitled "Infectious Mononucleosis." Numerous charts and slides were shown.

DISCUSSION

Dr. Cross (Minneapolis): Dr. Richards has beautifully presented this subject. I shall not attempt to say anything about the hematological side, as there is nothing more to say. From the clinical standpoint there is a great deal that is open to discussion. Dr. Richards believes the condition to be a clinical entity which can be diagnosed by a peculiar blood finding. Leaving out of account the earlier cases of glandular fever which were not accompanied by blood studies, we can generalize this far, that the cases described by competent observers have these things in common: in the first place there is the adenopathy, with temporary enlargement of the spleen. So far as known, this adenopathy has not persisted. Second, there is not a progressive increase in the leucocytosis. Most of the cases run from normal to 30,000. Third, they recover. There are probably, in the hands of expert hematologists, diagnostic changes which can be depended upon in the form and staining of these cells. However, these cells are not always present in the cases which otherwise may be included in this group. They are, when present, probably recognizable by careful search. One point which has been quite evident in reading over the descriptions of the Johns Hopkins and other cases is that there has been a certain epidemicity that cannot easily be explained. Another point is that they occur at quite a wide range of ages, up to 30.

The interest to the clinician is the question or problem of whether or not we have a distinct clinical entity or disease, or whether we have lymphocytosis and the occurrence of adenopathy in certain infections which are not otherwise to be differentiated from cases which do not show these blood changes or adenopathy. This question must be considered as yet *sub judice*. Cabot's studies were made on acute infections in which streptococci predominated. So far as known, no new infectious agent has been found in these cases. In favor of the disease being a clinical entity are: these peculiar and fairly uniform blood findings, the fact that it shows a uniform lymphocytosis and adenopathy, and that all cases recover. As against that is the fact just stated, *i.e.*, that we have infections similar to these lasting about the same time, due to the same infectious agent, but without the blood changes, adenopathy and lymphocytosis; rather a polymorphonuclear leucocytosis. Turck, who was an authority on blood work, contended, I think, with others, that acute lymphatic leukemia is an infectious process and while he did not state what he considered the infectious agent to be, he felt that all the diseases which show these blood changes must be due to infection.

The etiology of the cases in this group is most interesting. The question, for instance, whether it is possible that an infectious agent at one time may cause one set of blood changes and at another time another, or none, due to some peculiar characteristic of the infectious agent. Second, whether there are certain individuals who react in a peculiar or unusual way to a given infectious agent.

There is abundant clinical and experimental ground for the hypothesis that a given strain of bacteria can, through cultivation in the body, acquire a selective capability of attacking certain tissues. The same organism may after passing through other cultivations leave alone the tissue formerly attacked, and find lodgment and grow in entirely

different tissues, or produce quite different reactions in the body.

It is a most interesting condition, upon which the last word has not been said.

Dr. Giffin (Rochester): Much of my own work is in connection with diseases of the blood, and I am therefore especially interested in Dr. Richards' paper. It covers the subject in an unusually complete manner. The first case, in which there was bleeding from the gums, would very strongly suggest leukemia, and the fact that it did not prove to be leukemia is consequently very instructive. In our experience infectious mononucleosis is rarely seen. I have in mind only two cases of this condition that eventually recovered. One patient's blood returned to normal in about six months. Many cases of various types of infection with high leucocyte count and high lymphocyte count have been seen, and we have been inclined to regard infectious mononucleosis as a more severe reaction of a similar type of infection. In general, when the lymphocyte percentage is below 80 per cent, the burden of the proof is upon the physician who makes the diagnosis of leukemia, and when the lymphocyte count is above 90 per cent the burden of the proof is on the physician who makes a diagnosis of infectious mononucleosis. The most important thing, however, is the careful study of the blood smears and the finding of definitely immature cells. It will be very interesting to follow these cases for a longer period of time and to learn what happens later in life, especially to see whether there is any later return to the leukemic type of reaction.

The meeting adjourned.

John E. Hynes, M.D.,
Secretary.

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

TRANSPOSITION OF AORTA AND PULMONARY ARTERY

REPORT OF CASE*

Arild E. Hansen, M.D., and Chester A. Stewart, M.D.
Minneapolis

Transposition of the main arterial trunks of the heart, while not especially rare, is of interest from the standpoint of diagnosis and prognosis. The diagnosis of the condition is difficult and the prognosis, as a rule, is very grave, for most patients having this congenital anomaly die in early infancy.

Matthew Baillie,[1] in 1797, was the first to report a case of the transposition of the great vessels of the heart. Before the days of Laennec, the condition of morbus caeruleus was recognized, but the era of progress in the study of congenital heart disease dates from the advent of auscultation, which resulted in the discovery of abnormal sounds in the precordial area of many of these "blue-babies." Peacock,[2] in 1854, produced the earliest standard English work on this subject and Rokitansky gave great impetus to the study of congenital heart disease by his hypothesis as to its etiology. The work of Rokitansky[3] (1875) probably is still the most lucid and complete discussion of the subject. He described sixteen possible forms of transposition, due to different degrees and combinations of deviation and malunion of the aortico-pulmonary and interventricular septæ. Lochte[4] (1898) suggested that certain types of transposition can be explained by the twisting of the ventricular loop independently of the heart, which theory Lewis (1915) also accepts. In spite of objections by Keith[5] (1909) and others, the theories of Rokitansky and Lochte are usually accepted as the cause of the transposition of the main arterial trunks of the heart.

Aside from this brief allusion to some of the outstanding studies of this condition, no attempt is made in this paper to make any exhaustive review of the voluminous literature on the subject of transposition of the great vessels of the heart. Attention may be called to reports by Bellingham-Smith,[6] Jacobson,[7] Wohl,[8], Johnson[9] and others who recently have reported cases of transposition of the main arterial trunks of the heart.

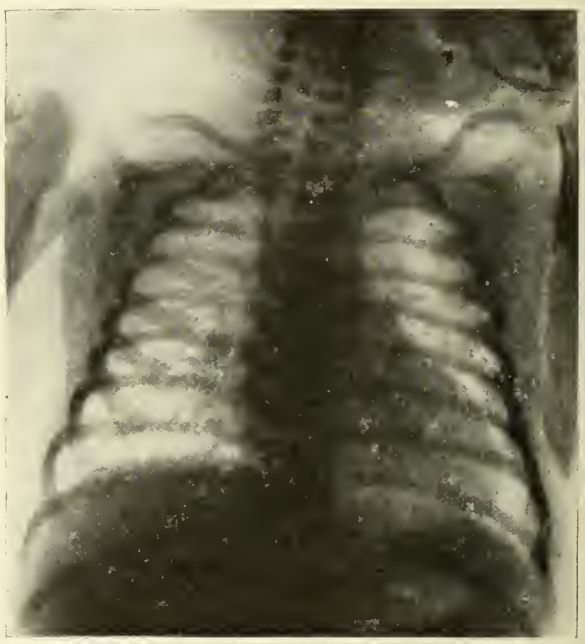


Fig. 1. Taken second day of life. Shows normal cardiac shadow and broad shadow in thymic area.

The case of transposition of the great vessels of the heart with which this report is concerned occurred in baby girl H., born at term. The delivery was entirely normal and the baby seemed well at the time of birth except for the appearance of slight transitory attacks of cyanosis when crying. In the second day of life an *x*-ray of the

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chest was taken to determine, if possible, the cause of the cyanotic attacks. The *x*-ray, however, revealed the heart to be normal in size, shape and position. The presence of an unusually broad shadow in the upper mediastinum led to a tentative diagnosis of status thymico-lymphaticus, which at the time was considered to be the cause of the cyanotic attacks. In addition, a few areas of pulmonary atelectasis were noted, but these were not considered to be of clinical significance. The following ten days of postnatal life were uneventful and the baby was discharged from the hospital in good condition. During this period the condition of the baby was apparently normal and no further recurrence of the cyanotic attacks occurred.

A few days after being discharged from the hospital the baby developed a slight cough, and when about four weeks of age a moderate transitory cyanosis of the hands and feet reappeared which at first was not sufficiently marked to alarm the parents. During this interval, the baby failed to gain weight properly. At the age of five weeks, however, the cyanosis became so marked that one of us was called to see the baby. Upon examination an alarming cyanosis of the extremities and face was discovered. The examination of the heart failed to reveal the presence of cardiac enlargement or murmurs. The respiration was labored and numerous crepitant râles were heard, especially at the bases. In addition an area of bronchial breathing

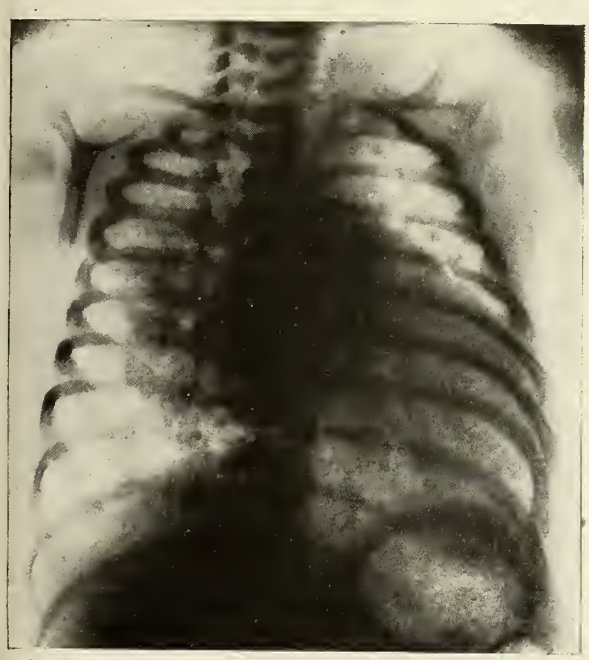


Fig. 2. Taken at five weeks. Shows area of consolidation in the right lung, extending from the right border of the heart to the periphery of the lung. The heart is greatly enlarged.

and impaired resonance was discovered on the right side near the angle of the scapula. Due to the fact that the maid and also the mother had had a chronic cough, the possibility of pulmonary tuberculosis as being responsible for the condition of the baby was considered.

The baby was admitted at once to the hospital. An *x*-ray taken at this time revealed an area of consolidation in the right lung, extending from the right border of the heart to the periphery of the lung. The heart also was greatly enlarged, especially to the right. In view of the obvious pulmonary findings together with the complete absence of any abnormality of the heart sounds, the cardiac enlargement did not attract attention at that time. Therefore the baby was thought to be suffering essentially from pulmonary disease, possibly of tuberculous origin. The symptoms became more marked and the baby expired in a few hours.

At necropsy, the infant had a marked cyanosis of the face and extremities. The width of the thorax at the level of the dome of the diaphragm was 11 cm. and at the costal arch was 12 cm. The width of the pericardial sac measured 6 cm. On opening the sac, the right auricle was found to be greatly distended, and the pulmonary conus and left ventricle were dilated. *In situ*,—a probe inserted into the vessel leaving the right ventricle, passed through the arch of the aorta into the vessels of the neck. When passed through the left ventricle, the probe entered the pulmonary vessels. The superior and inferior vena cavæ and pulmonary veins were normal. The left auricle was normal in size, but the right auricle was considerably dilated and slightly hypertrophied. The right ventricle was greatly dilated, the wall being somewhat hypertrophied, while the left ventricle was normal. There were no other defects, aside from a slight patency of the foramen ovale. The pulmonary, aortic, and atrio-ventricular valves, and also the coronary arteries, were normal. The aortic os of the ductus arteriosus was closed, but on section there was a potential lumen present. The lungs were partially collapsed and presented slight congestion on section. The liver, spleen and kidneys were congested. The thymus weighed five grams and apparently was not enlarged.

As a result of the necropsy findings an explanation of the clinical symptoms became evident. The cyanosis occurring in this baby was due to failure and dilatation of the right side of the heart. In addition, this enlargement of the right auricle and ventricle mechanically compressed the right lung, giving rise to physical signs indicating pulmonary consolidation. The râles heard undoubtedly were due to pulmonary congestion and edema.

The diagnosis of transposition of the great vessels of the heart can rarely be made antemortem. In babies having extreme cyanosis and cardiac enlargement, the condition may be suspected, however, particularly in instances where there is no audible cardiac murmur. Furthermore, the frequent occurrence of other congenital heart defects associated with transposition of the vessels of the heart, as pointed out by Keith,[10] Humphrey,[11] Abbott[12] and others, makes a correct clinical diagnosis entirely a matter of chance. The only diagnosis possible in this condition is congenital heart disease, and in cases having cyanosis and heart enlargement without cardiac murmurs, transposition of the great arterial trunks of the heart may be suspected.

On comparing congenital with acquired heart disease in children, marked differences in features usually are noted. In congenital heart disease the prominent features include cyanosis dating often from birth, polycythemia, high hemoglobin per cent, cardiac enlargement especially to the right side, clubbing of the fingers and toes, and

usually absence of edema and ascites. In acquired heart disease cyanosis and clubbing of the tips of the fingers and toes appear later in the more advanced stages of the disease. In addition there is usually a secondary anemia instead of the polycythemia characteristic of congenital heart disease. The age of onset of symptoms is very important, for acquired heart disease is very rare before the age of three years. It is evident, therefore, that many of the prominent symptoms occurring in congenital heart disease are just the reverse of those commonly found in acquired heart disease. The differential diagnosis as to the location of the lesion in these conditions on the basis of the murmurs heard is fraught with such a great percentage of error that we will not attempt a discussion of this feature. In such cases a careful study of the abnormal cardiac sounds, however, is of value in making a diagnosis as to the type of lesion present, particularly in the acquired type of the disease.

SUMMARY

(1) The occurrence in infants of cyanosis of cardiac origin not accompanied by audible murmurs in the precordial area is strongly suggestive of the existence of a transposition of the main arterial trunks of the heart.

(2) In infants having this congenital anomaly, the *x*-ray at birth may reveal the heart to be normal in size, shape and position. This feature apparently has not been emphasized in the past. Pronounced cardiac dilatation associated with definite hypertrophy, especially of the right side of the heart, may develop in such cases, however, during the first few weeks of post-natal life.

(3) The cardiac dilatation occurring in babies having a transposition of the main arterial trunks of the heart may cause pulmonary compression of sufficient degree to produce findings indicative of pulmonary consolidation and thus obscure the diagnosis of the existing cardiac pathology.

BIBLIOGRAPHY

1. Abbott, Maude E.: Osler's Modern Medicine, IV, 368.
2. Ibid.
3. Poynter, C. W. M.: University Studies—Nebr., Oct., 1916, XVI, 4, 244.
4. Ibid. 248.
5. Keith, Arthur S.: Lancet, Aug., 1909, 177, 359, 433.
6. Billingham-Smith, E.: Practitioner, Nov., 1922, 109: 365-9.
7. Jacobson, Victor: Am. Jour. Dis. Child., 1921, 21: 176-182.
8. Wohl, M. G.: Jour. Lab. and Clin. Med., July, 1925, 10:812-6.
9. Johnson, Frances M.: Med. Jour. and Record, Feb. 18. 1924, 121:231.
10. Keith, Arthur S.: Lancet, Aug., 1909, 177-433.
11. Humphrey, Laurence: System of Medicine, Albutt and Rolleston, VI, 287.
12. Abbott: Osler's Mod. Med., IV, 372.

POSSIBLE RELATIONSHIP BETWEEN SYPHILIS AND SUPPURATIVE DISEASE OF THE LUNG: REPORT OF TWO CASES*

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Case 1.—A man, aged thirty-three years, came to the clinic March 15, 1925, complaining of a persistent cough which was productive of green, purulent sputum. He had been accustomed to using heroin in 1/12 grain doses and codein in ¼ grain doses over a long period of time. This had been advised because of the persistent cough. He had also used calcium lactate to control frequent hemorrhage. He used alcohol and coffee in moderation, but did not drink tea nor use tobacco. In 1919, and again in 1921, he had had bilateral pneumonia, but apparently made good recoveries each time. He said that he had had mild attacks of influenza and that there had been some evidence suggesting tuberculosis, but there had never been conclusive proof of it. There had been no evidence at any time of infection with either syphilis or gonorrhea. He had been operated on twice. In 1920, Delille, of Paris, attempted to produce a pneumothorax, hoping to stop the cough, profuse expectoration and hemorrhage. This had proved a failure, and in 1924, Lecine, of Paris, had severed the left phrenic nerve.

The patient's complaint began in 1909, when he was thought to have tuberculosis and was treated accordingly. Since then his chief complaints have been a continuous cough, productive of large amounts of green, purulent, malodorous sputum, and many hemorrhages, some of which were very small and others of even dangerous proportions. Associated with these symptoms, he had had pleurisy, and felt certain that on one occasion he had had an effusion which had been spontaneously absorbed. It seemed that the phrenicotomy not only was of no value, but also added to his disability because of the resulting discomfort in the stomach, mainly characterized by flatulence and distention, which was relieved only by belching and the use of soda. The patient was an extremely nervous man, who complained a great deal of insomnia. He had had a thorough gastro-intestinal examination in Paris a year before, but no evidence of disease in the gastro-intestinal tract had been found. The Wassermann reaction was repeatedly negative.

At examination, he appeared to be a healthy young man, weighing 157 pounds, a gain of 14 pounds over his usual weight. He was 6 feet, 0.5 inch tall. His blood pressure was 115 systolic, and 78 diastolic; his pulse was 100 and temperature 98. The right side of the chest was larger than the left and the amplitude of movement on the right much greater than on the left side. This could be most easily seen by observing the costal borders anteriorly and the movement of the scapular angles posteriorly. By percussion, the area of dullness was 7 cm. higher on the left side than on the right and was stationary, whereas that on the right varied with inspiration and expiration. Crackling and bubbling râles were heard, particularly at the left base, although a few scattered râles were heard on the

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right side. Vocal fremitus and vocal resonance were absent over the dull area on the left side, while breath sounds and whispered sounds were markedly diminished.

The right pupil was noticeably larger than the left; the reflex to light had been lost in the right eye, but in the left was normal. The reflex to accommodation was distinctly decreased; the reflexes on the left side were normal, and after the use of cocain, the right palpebral fissure and the pupil became smaller than the left. The knee jerks and Achilles' reflex were absent on the right and much reduced on the left side. Sensation and station were not disturbed. The fingers were moderately clubbed. Urinalysis and blood count were normal, and the sputum examination on each occasion showed elastic tissue, but no tuberculosis bacilli nor saprophytic organisms of Buday. Because of the peculiar pupillary changes, a Kolmer-Wassermann test was made, and reported as very strongly positive, 44. The patient's tonsils were large, fibrous and septic, and contained liquid pus. Roentgenograms of the chest showed marked infiltration in the left lower lobe, characteristic of bronchiectasis, as well as an old calcified lesion at the left apex. Fluoroscopic examination showed that the left diaphragm was 5 cm. higher than the right, and did not move with respiration. The pleura was noticeably thickened over the left base. The stomach was normal according to the roentgenogram. The diagnosis was: bronchiectasis of the left base with thickened pleura and paralyzed diaphragm, septic tonsils, and syphilis with parenchymatous changes of the central nervous system.

The patient was referred to the Section on Neurology, where a diagnosis of parenchymatous and interstitial types of syphilis of the central nervous system was made. He was then referred to the Section on Dermatology and Syphilology for treatment. The Nonne test of the spinal fluid was positive, 36 cells in the fluid, and a reading of 444-441, significant of paresis.

During the patient's stay, further gastric symptoms developed, characterized by severe epigastric pain, passing band-like around the body. Under treatment for syphilis there has been a decided decrease both in the amount of sputum and the frequency of the cough.

Case 2.—A man, aged fifty, came to the clinic January 20, 1926, complaining of cough with expectoration and fever. He had had influenza in 1923 and again in 1925. The onset of his trouble occurred nine months previous to his admission. He had been perfectly healthy until his first attack of influenza, which had not been very severe, but which was followed by repeated recurrence of infection. His temperature had registered from 99 to 100° every day for eight weeks. At that time he had no cough and finally seemed to make a satisfactory recovery. However, five months later he had a recurrence of infection and his cough became troublesome, although at first it was nonproductive. After each recovery the infection recurred until in October, 1925, he went to New Mexico to live in a dry, warm climate. However, he had similar recurrences there, with reappearance of cough, which soon became productive of large amounts of sputum, gradually changing from a yellow mucopurulent type to a thinner greenish type, and soon becoming malodorous. The patient had slight fever much of the time. Many examinations of the sputum were negative for tuberculosis bacilli. The patient noticed that a change of posture always affected the cough, especially if he assumed a stooping position. On several occasions he had slight hemorrhage. A diagnosis of lung abscess was made.

At the time of his visit to the clinic he had been having chills, continuous cough, dyspnea, and loss of weight. He weighed 164 pounds, which represented a loss of 36 pounds in six months. His blood pressure was normal, pulse rate 100, and temperature 98.2°. He looked ill, and had a sallow complexion with some evidence of pigmentation on the face and neck. Although the pulse rate was rapid, his heart was objectively negative. In the examination of the lungs, only bubbling râles could be heard; there was neither loss of expansion nor percussion change. The blood count was normal except that the number of leukocytes varied from 11,000 to 21,600. The analysis of the sputum showed occasional spirilla, but no evidence of elastic tissue nor tuberculosis bacilli. The blood Wassermann was very strongly positive, but the Wassermann test of the spinal fluid was negative, although there was a positive reaction to the Nonne test. A roentgenogram of the chest gave evidence of bronchiectasis in both lower lobes, more marked on the right side. The patient had no evidence of involvement of the central nervous system and was referred directly to the Section on Dermatology and Syphilology for treatment. His reaction to antisyphilitic treatment was spectacular; not only was a remarkable improvement made in general physical well-being, but the signs and symptoms of bronchiectasis rapidly decreased. After the first series of treatments he was practically symptom-free and was allowed to go home, where further treatment could be administered later.

Comment.—There is no positive proof that these two cases represent definite syphilitic infection of the lung. The evidence is purely circumstantial and is based on the fact that each man had both syphilis and bronchiectasis, and that they responded in a similar manner to active treatment for syphilis. In the second place, the fact that syphilitic disease of the lung frequently causes fibrosis is significant when considered in connection with the fact that fibrosis of the lung, when associated with cough, frequently results in the weakening of the bronchial walls and the production of bronchiectasis. The benefit produced by salvarsan cannot be ascribed to the clearing up of saprophytic bacteria, because in these instances no fusiform bacilli or spirilla were found in the sputum. It is not unusual to obtain brilliant results from the use of salvarsan when these types of bacteria predominate.

No surgical procedures were advised in either case. It was thought best to continue with antisyphilitic treatment and later observe the progress of the pulmonary disease.

Corpora Lutea Soluble Extract.—P. D. & Co.—A solution of an extract of desiccated corpus luteum in physiological solution of sodium chloride, each c.c. containing 0.02 gm. of soluble extract. For a discussion of the actions and uses, see Ovary, New and Non-official Remedies, 1925, p. 251. The product is marketed in 1 c.c. ampules. Parke, Davis & Co., Detroit. (Jour. A. M. A., May 8, 1926, p. 1440.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SURGERY

SUPERVISORS:
DONALD K. BACON,
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MAYO CLINIC, ROCHESTER

DERMOID CYSTS OF THE MEDIASTINUM: Howard L. Beye (Annals of Surg., 83, 5 pp., 577-84). Only 118 dermoid cysts of the mediastinum have been reported, but they form a group of intrathoracic tumors which are frequently amenable to surgical treatment. They may occur at all ages, but are most frequently found between the ages of 15 and 30.

They present a symptom complex which is variable and may be due to pressure or to irritation. The onset of symptoms is often insidious and cough is the commonest initial symptom. Hemoptysis is not uncommon and hair and other constituents of the cyst may be found in the sputum. Dyspnea, dysphagia, and a sensation of substernal pressure or even sharp stabbing pains may be present. The onset may be acute and simulate empyema, etc. Fever and weight loss are common symptoms and a swelling may develop with or without other symptoms.

The course may be rapid or slow, but in a majority of reported cases the patient succumbed in from one to four years when not successfully treated.

The finding of hair by aspiration of the tumor, or the appearance of toothlike structures in the *x*-ray, are diagnostic signs. In the differential diagnosis must be considered all cases of solitary intrathoracic tumor, aneurism, and pleural and pulmonary infections.

The tumors vary greatly in size and position. While they usually displace adjacent tissues rather than become embedded in them, their close contact with, or adherence to the large vessels in the upper mediastinum is the chief concern in their surgical treatment. Their structure may be simple or fairly complex, with areas of epithelium, bone plates and cartilage or even teeth buried in the walls or lying in the cavities. Most authors regard the simple tumors as derived from the third branchial arch.

If the presence of a dermoid is suspected, exploration is indicated. The treatment is total extirpation when possible, and drainage in the other cases. Drainage will accomplish a cure in some cases and in others it may reduce the size of the tumor so that its removal may be considered later.

H. E. Simon, M.D.

THE TREATMENT OF PELVIC INFECTIONS: Thomas H. Cherry (S., G. and O., Vol. XLII, No. 5, May, 1926, pp. 600-607). The author reviews 1,105 cases of pelvic infection. Of these eighty-eight per cent were of gonorrheal origin.

Conservative treatment exclusively is unsatisfactory, as the patient ignores the advice as to returning for further treatment and frequently reinfection occurs. Injection of foreign proteins did not prove satisfactory. Diathermy was found to be an excellent thing both as a palliative measure before operation and as non-surgical treatment, providing the infection was of gonorrheal origin. It caused a resolution of pelvic masses in 66.6 per cent and relieved pain in practically 100 per cent. It also controlled the infection in the lower genital tract by proper application of the electrodes. The white blood count was found to be a more accurate index of the activity of infection than the sedimentation test.

Initial acute attacks should not be treated surgically, as they subside and if proper treatment of the lower genital tract is instituted reinfection should not occur.

Recurrent attacks of pelvic inflammation are excellent reasons for surgical intervention. Pelvic surgery can be performed with a reasonable assurance of not more than 3 per cent mortality if temperature has been normal from three to ten days and leukocyte count is below 16,000.

When in course of removal of infected adnexa contamination occurs, the best results as to mortality and wound union are obtained by closure without drainage. If drainage is necessary the vaginal route is more satisfactory than the abdominal.

P. G. Flothow, M.D.

THE EXPERIMENTAL PRODUCTION OF DUODENAL ULCER BY EXCLUSION OF BILE FROM THE INTESTINE: Robert Kapsinow (Annals of Surg., 83, 5, pp. 614-617). Our knowledge of the etiology of chronic duodenal ulcer in man is largely limited to hypotheses. In dogs acute ulcers can be produced under a variety of conditions but chronic ulcers are difficult to produce. Mann and Williamson obtained chronic ulcers in that part of the intestine which is adjacent to the pyloris in a large proportion of their experiments which involved the transplantation or excision of the duodenum or the transplantation of the bile and pancreatic ducts into a point in the intestine far away from the stomach.

The author reports a series of experiments in which the fundus of the gall bladder was implanted transcortically into the pelvis of the right kidney, establishing a cholecysto-nephrostomy. Later the common duct was ligated. Following the second stage of this procedure the animals lost weight and refused food. At necropsy, 17 of 43 animals showed duodenal ulcers, single or multiple. These had the appearance of the subacute or chronic type of peptic ulcers in man.

He concludes that by this method ulceration can be produced without trauma to the intestinal wall as a contributing factor and in dogs not previously diseased.

H. E. Simon, M.D.

AIDS TO CHOLECYSTECTOMY: Charles L. Gibson (Annals of Surgery, Vol. LXXXIII, No. 5, May, 1926, pp. 618-621). The author lists some of the procedures which he finds of value in cholecystectomy. First of these is the incision. In cases where the diagnosis is sure, he makes a Courvoisier incision—one parallel to the costal margin, which gives good exposure and spares the nerves. In most cases he finds the commonly used method of dissecting from below satisfactory, but in difficult cases where the relations of the dangerous triangle are obscured by pathology, he prefers the method of cholecystectomy from above downward. He does a subserous excision, enucleating the gall-bladder from its peritoneal coat, thus leaving both the subserous layers and the liver substance uninjured. When the end of the dissection is reached, the gall-bladder hangs by a single structure which can be only the cystic duct. After the duct is ligated, he buries it in a fatty peritoneal bed, utilizing either a fatty tab from the upper surface of the transverse colon or a similar structure from the gastro-hepatic omentum. This peritoneal blockade makes closure without drainage safe in a large number of cases.

In getting hemostasis he emphasizes the fact that any of the strands of tissue remaining after dissection of the duct may contain the cystic artery and, therefore, all of these strands should be carefully and doubly ligated.

He has found closure without drainage very satisfactory, convalescence easier, with no complications from drainage or hernias.

P. G. Flothow, M.D.

PEDIATRICS

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SOME INTERESTING POINTS IN PEDIATRICS FOR THE GENERAL PRACTITIONER: By Z. Sharfin, M.D. (Archives of Pediatrics, May, 1926). In examining a child, or even an infant, try to show kindness, and you will gain the confidence of child and mother. In using the stethoscope, especially the kind with the metal tip, it is advisable to warm it before applying it to the child's body. The taking of the temperature should be the last procedure. The examination of the throat should be the next before the last procedure in the order of examination. The examination of the throat should never be overlooked.

Infants as a rule require very little medication. In prescribing medicines to infants and children, pay attention to making it palatable and pleasant to take.

Convulsion in a child usually means the beginning of illness. There are three common conditions that give a chill in a child. These are pyelitis, otitis media and malaria. Cough is not always due to an infection of the respiratory organs. Vomiting in infants and children may not always be due to direct gastrointestinal disturbances. Any infectious disease may start with vomiting and it is one of the cardinal symptoms in scarlet fever. Recurrent vomiting in a child often has its origin in imitation, worry, or fear.

In treating children one must take into consideration not only the physical condition but also the mental side of the child's life and treat the child accordingly. To the same category belong also certain types of enuresis, some feeding problems, night terrors and allied conditions. In appendicitis the temperature is rather low. A gangrenous appendix often shows very little rigidity and can develop in a very short time. The classical and physical signs, such as rigidity, localized tenderness, and distension are present only in a small number of cases. Another condition which occurs in infants is intussusception. Shock, acute onset, sausage shaped mass, blood from the rectum and no stools. Blood on the thermometer, while taking the temperature even in the absence of the classical tumor, may disclose the condition.

In connection with the treatment of diarrhea, the more common type we meet is the fermentative type, and therefore the time-honored barley or rice water will aggravate the condition instead of improving it; while the use of casein or protein milk will help to cure it.

A nasal discharge, especially with slight hemorrhage, should put one on his guard and a culture for the Klebs-Loeffler bacillus should always be taken.

In a young child, complaining of gastric oppression with a slight coryza and conjunctivitis, measles should be suspected even before the Koplik spots develop.

In conclusion the author calls attention to the possibility of cerebral hemorrhages in the new-born. These hemorrhages occur even in normal labor. A peculiar pallor, cyanosis, or refusal to nurse should attract one's attention and make one suspect the condition.

R. N. Andrews, M.D.

INFLUENZA IN INFANTS AND CHILDREN: James Burnet, M.D. (Arch. of Ped., April, 1926). The incubation period in those cases was exceedingly short, in one or two instances 24 hours. In the majority of cases the temperature was high, ranging from 102.6 to 105. In every case the prostration and accompanying apathy and lethargy were well marked.

I. *The Catarrhal Type.*—This was by far the commonest. Running from the nose, a dry, hard cough of an extremely irritating character with, in some instances, vomiting and diarrhea characterized this type.

II. *The Cerebral Type.* — The infant or child in this variety of the disease looked like a meningeal case. There was often twitching of the mouth and extremities with an unusual degree of drowsiness and stupor, which in some cases amounted almost to coma.

III. *The Colic Type.*—The child began by complaining of a colicky pain in the region of the umbilicus which gradually became more and more intense, causing the patient to cry out. On examination the abdomen in the center was definitely tender; but peripherally and in the flanks there was no pain present. Vomiting never occurred. Partaking of cold liquids increased the pain. There was no diarrhea. It is not easy to explain the origin of this pain, but the author thinks it may have been due to an

affection of the intestinal muscles, leading to spasm with consequent colic. In addition to this colicky pain, these cases all presented the characteristic dry, irritative cough so typical of influenza.

The treatment of influenza in early life may be summed up in a series of statements as follows: (1) Keep the patient warm in bed. (2) Give a febrifuge in all cases, with small doses of vin. ipecac, which renders the cough softer and looser. (3) Feed light. (4) Watch the ears. (5) In the colic cases, warm linseed poultices are very useful in relieving the pain.

R. N. Andrews, M.D.

APPENDICITIS IN CHILDREN UNDER FIVE YEARS OF AGE: By Frederick Christopher, M.D. (Amer. Jour. of Diseases of Children, April, 1926). Acute appendicitis in children under five years of age is a relatively infrequent disease. One should watch for appendicitis during and immediately after tonsillitis and the acute exanthemas, especially measles. The early development of gangrene is characteristic of appendicitis in young children.

Finney has said that "in the adults, the tendency is perhaps rather to mistake something else for appendicitis, while in the child it is to mistake appendicitis for something else."

Pain is one of the cardinal symptoms of acute appendicitis in young children. Pain, then, which is an invariable symptom of appendicitis, is at first referred to the region of the umbilicus. A very important sign is that changes of position or being moved are resented by the child. Howland believes that the assumption of the sitting posture without complaint argues strongly against appendicitis. Pain at the umbilicus or during micturition has been said to have more weight than the absence of tenderness in the right flank and muscular defense. Holt believes that vomiting is probably the most constant symptom.

The greatest tact, patience, and strategy must be employed in the approach to and during the physical examination. Be sure to learn the child's first name. The hand should not be removed from the abdomen during a prolonged examination. The demonstration of right-sided involuntary rigidity or muscle defense is an extremely important diagnostic factor. When the infection becomes localized, the rigidity tends to diminish. There may be absence of rigidity. Rectal examination must never be omitted in doubtful cases.

Howland says that elevation of temperature is a constant accompaniment of appendicitis. The leukocyte count is of the highest diagnostic importance. A low count without polyneucleosis generally excludes acute appendicitis.

While a great many pathologic conditions have been enumerated as causing confusion with acute appendicitis in infants, the differential diagnosis most commonly rests between acute appendicitis on one side, and pneumonia, pyelitis, enteritis, intussusception, and pneumococcus or streptococcus peritonitis on the other. With older children, primary pneumonia is frequently considered to be appendicitis. It must be remembered that painful micturition and pyuria may occur in appendicitis nor does a single specimen of urine without pus exclude pyelitis.

It will be best to consider every young child with abdominal pain and vomiting as a potential case of appendicitis. General peritonitis is a much more common sequel than in the adult. No child with abdominal symptoms should receive a cathartic until the possibility of appendicitis has been excluded. Early operation for appendicitis is more important in infants than in adults.

In the postoperative treatment, the body temperature should be maintained and the patient kept as quiet as possible. Fluids and nourishment must be given promptly.

R. N. Andrews, M.D.

EYE, EAR, NOSE AND THROAT

SUPERVISORS:

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BLASTOMYCOSIS OF THE LARYNX: Chevalier Jackson (Archives of Oto-Laryngology, February, 1926, Page 99). Blastomycosis is a rare disease, but probably not so rare as the scarcity of literature on the subject would indicate. It is hoped that its recognition as an early diagnosis will in the future lead to more frequent detection and result in cure of the otherwise fatal disease.

He presents three cases.

Occupation.—These men were, respectively, laborer in a grain elevator, poultry huckster and clerk in a general store. The last patient gave a history of having a cough and "sore throat" noticed while on a farm threshing grain.

Etiology.—Special exposure is fairly clear in the histories of at least two of the three cases. The first patient gave a clear history of having cleaned out old wood from the bottom of a grain elevator a few days previous to the onset of the initial symptoms.

Symptomatology.—Initial symptoms in all three cases were hoarseness and cough, at first non-productive; later there were limited amounts of expectoration.

Pathology.—The regions involved besides the larynx were the pharynx, tonsil, trachea and lungs. The skin was involved in only one patient and this was a secondary extension after tracheotomy. In the larynx there were abscesses that are superficial on the surface, leaving an ulcerated spot among other as yet unruptured nodules.

Histology.—The histologic picture was suggestive of tuberculosis in all three patients. Inflammatory infiltration, proliferation of the epithelium, giant cells and minute abscesses were present. The characteristic in all three was the presence of spherical, encapsulated parasitic cells. These were demonstrated in the tissues in the three patients. Mycelia were not present in the tissues.

Bacteriology.—The sputum was scanty in all cases, but the blastomyces were demonstrated in smears of sputum and secretions. Mycelia were demonstrated in the sputum of two of the patients.

LARYNGOSCOPIC APPEARANCES

The appearances in the mirror of all three cases were similar, being inflammatory with a grayish, minutely nodular surface in some portions of the lesion, with a few min-

ute, isolated yellowish nodules. In all cases there was in some portion of the lesion an appearance as after an application of silver nitrate, and some of this membrane came away on coughing, leaving a red, inflammatory, eroded and, in small spots, ulcerated surface. In two patients the epiglottis was involved, in one of them there was a V-shaped ulceration on the free margin, the lesion extending onto the tongue. The cords were nodular in only one patient, but glottic stenosis was marked in cases requiring tracheotomy.

In considering laryngoscopic appearances, it may be well to remember that the stage of the lesion, or part of the lesion, is important. In the early stages it may be flat; the nodules and yellow or grayish points are minute, superficial abscesses. When the abscesses rupture, the lesion flattens at that point. Exudate may cover considerable areas of the lesion. The mucosa that was not covered with grayish nodules was a deep crimson, the intense redness being in marked contrast to the pallor so often seen in the pale type of laryngeal tuberculosis.

Diagnosis. — Diagnosis can be made with certainty by biopsy and bacteriologic examinations.

Complications.—Pulmonary complication was slight. Extension in the skin surface was present in one patient.

Prognosis.—One patient of the three died of the disease, one recovered, and one is still under treatment.

Treatment.—The unfavorable results from surgical treatment of blastomycosis of the skin evidently influenced the three observers against surgery. The good results obtained by the dermatologists with potassium iodid in blastomycotic dermal lesions point to treatment by this drug as the method of choice. The selective effect of potassium iodid on the laryngeal mucosa strengthens the indication for its use. The results in Cases 2 and 3 confirm this theoretic consideration.

CONCLUSIONS

1. Blastomycosis of the larynx is a rare disease, but may not be quite so rare as case reports in the absence of mention would indicate.

2. The clinical and even histological resemblance of this disease to laryngeal tuberculosis would seem to urge the necessity of the exclusion of blastomycosis in every case of laryngeal tuberculosis in which tubercle bacilli are not found.

3. The diagnosis cannot be made positively otherwise than histologically.

E. L. Armstrong, M.D.

OCULAR PAIN: By A. Freeland, Fergus, M.D. (British Medical Journal, Sept. 19, 1925). Ophthalmic pain, excluding that of glaucoma, depends upon two main factors: First, errors of refraction, of accommodation, or of muscle balance; second, septic infection. For the former, an accurate correction of the various errors is essential. Occasionally prisms or operation will be required. A definite exercise of the lateral recti is necessary to the maintenance of parallel visual axes in binocular distant vision; but these muscles, if kept at highest tension, become fatigued. Therefore, a reserve of two and a half or three degres of prism minimum deviation must be retained; that is, if a prism of this strength is placed, edge out, before either eye, binocular vision must be maintained. A defect in this latent divergence not infrequently causes much pain in and about the eye, yet it may be easily overlooked.

When an operation wound or an ulcer of the cornea becomes painful it almost always signifies the onset of sepsis. This may be due to faulty technic or to a blood-borne infection, such as syphilis, tuberculosis, gonorrhea or focal infection. For early corneal ulcers of the ordinary type, without hypopyon or staphyloma, cocaine should never be used because deep pain is not relieved and the superficial tissues are injured. Atropin and other mydriatics are almost equally harmful. Such an eye should never be bandaged.

On the contrary, drainage must be promoted, and for this purpose such a miotic as 1 per cent pilocarpine, once or twice daily, is effective. A normal saline douche for the eyes, three times daily, and colored glasses, will also be found helpful. In the use of miotics for the treatment of such cases of corneal ulceration, we need not fear iritis, for when the latter occurs it does so because toxins have entered the anterior chamber, causing irritation of the iris. The best way to get rid of these toxins is to increase the drainage by the use of a miotic. On the other hand, in other forms of iritis the toxins are in the iris structure itself—not in the anterior chamber,—and in such cases atropine should always be employed.

Virgil J. Schwartz, M.D.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

International Medical Annual. A Year Book of Treatment and Practitioners Index. 44th year. Edited by Carey F. Coombs, M.D., F.R.C.P. (Medicine), and A. Rendle Short, M.D., B.S., B.Sc., F.R.C.S. (Surgery). 555 pages. Illus. Cloth, $6.00. New York: William Wood & Company, 1926.

Nursery Guide. Louis W. Sauer, Ph.D., M.D., Senior Attending Pediatrician, Evanston Hospital, etc. 2nd revised edition. 206 pages. Illus. Cloth, $2.00. St. Louis: C. V. Mosby Company, 1926.

The Thyroid Gland. Charles H. Mayo, M.D., and Henry W. Plummer, M.D. The Beaumont Foundation Lectures. Series No. 4. Auspices of Wayne County Medical Society, Detroit, Mich., 1925. 83 pages. Cloth, $1.75. St. Louis: C. V. Mosby Company, 1926.

A Manual of Normal Physical Signs. Wyndham B. Blanton, B.A., M.A., M.D., Associate in Medicine, Medical College of Virginia. 215 pages. Cloth, $2.50. St. Louis: C. V. Mosby Company, 1926.

THE ART AND PRACTICE OF MEDICAL WRITING. George H. Simmons, M.D., Editor and General Manager Emeritus, American Medical Association, and Morris Fishbein, M.D., Editor, The Journal of the American Medical Association. Cloth, $1.50. Pp. 163, with 21 illustrations. Chicago: American Medical Association, 1925.

This book gives simple and concise instructions on all the essential points to be observed in writing medical pa-

pers. It is especially valuable to the occasional writer and could be perused with profit by the more voluminous author.

Wm. W. Moir, M.D.

INTRAVENOUS THERAPY: ITS APPLICATION IN THE MODERN PRACTICE OF MEDICINE. Walter Forest Dutton, M.D. Illustrated with 64 figures, halftones and line engravings, some in colors. Second revised and enlarged edition. Cloth, $6.00 net. Philadelphia: F. A. Davis Company, 1925.

This book begins with a most interesting chapter on the history of transfusion and intravenous medication. This is followed by careful articles on modern methods of infusion, transfusion and the use of medicines in the veins. In chapters on the various diseases in which intravenous medication can be used, the indications, contraindications, dangers and precautions to be taken under different circumstances are given, together with a careful description of the technic to be used in the various methods. In the chapters on special diseases such as syphilis and pernicious anemia, the medicines to be used, the methods and the results to be expected are given. There is a chapter on the indications and technic of intravenous anesthesia and another on the methods to be used in entering different veins under varying conditions. As a whole, it is a well written comprehensive work, thoroughly covering the subject and is a valuable addition to any library.

Wm. W. Moir, M.D.

PSEUDO-APPENDICITIS. A Study of Mechanical Syndromes of the Right Lower Quadrant Simulating Appendicitis. Thierry De Martel, Chirurgien des Hopitaux de Paris, and Edouard Antoine, Medecin des Hopitaux de Paris. Authorized translation from the French by James A. Evans, A.B., M.D., Formerly Assistant Radiologist, Hospital, St. Antoine, Paris. Preface by R. Bensaude Medecin des Hopitaux. Philadelphia: F. A. Davis Co., 1925.

DeMartel and Antoine, in their book on pseudo-appendicitis, have once more very forcefully brought to the attention of the profession the many factors other than appendicitis which are responsible for pain in the right lower abdomen. The portion of the text which deals with etiology and diagnosis and the radiologic study is well worth reading, especially from the point of view of the general practitioner. It would seem that the purely mechanical causes of pain which they attribute to anatomical abnormalities either congenital or acquired have been assigned too positive a rôle in the causation of pain.

Likewise, disturbances of the physiology of the intestinal tract due to improper diet and chemical irritations due to cathartics, etc., together with unhygienic living have not been sufficiently emphasized. It is in this later respect that the book loses much of its value and prestige in that the authors advocate treatment which is not only unanatomical but unphysiological and is extremely hazardous to the patient even in the hands of the skilled surgeons. They recommend such operations as colopexy, bowel resection, ilio-sigmoidostomy, gastro-enterostomy, plication of mesenteries, resection of pericolic membranes and numerous procedures equally technical for the relief of vague abdominal pains associated with atonic bowels and with ptosis of abdominal viscera in a more or less marked degree.

Bearing these facts in mind, the reader cannot recommend this book or subscribe to the authors' views except for the earlier chapters on etiology and diagnosis.

Edward A. Regnier, M.D.

DISEASES AND DEFORMITIES OF THE FOOT. John Joseph Nutt, B.L., M.D., F.A.C.S. Professor of Orthopedic Surgery, Polyclinic Medical School and Hospital. Surgeon-in-chief, New York State Orthopedic Hospital for Children, etc. New York, E. B. Treat & Company, 45 East 17th Street, 1925.

This is an excellent little volume comprising some 300 pages entirely devoted to foot conditions. The material is well arranged. The first two chapters consider the anatomy and physiology of the foot rather carefully. The anatomy has been excellently presented, although it is somewhat tedious reading.

Several chapters are devoted to the treatment of congenital club foot and weak foot. These chapters should be extremely valuable to the general practitioner. The orthopedist, however, will probably not agree with all of the author's methods at the present time.

An extremely valuable chapter is devoted to minor ailments of the feet, which are so often neglected by the physician. Patients with these minor ailments often fall into the hands of chiropodists and shoe salesmen, because they are unable to get relief from their physician. This is a department of the modern practice of medicine which is sorely neglected, and Dr. Nutt has made a valuable contribution in this chapter alone.

Myron O. Henry, M.D.

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VOL. IX AUGUST, 1926 No. 8

PERIDUODENITIS*

A Discussion of Its Causes, Types, Symptoms, Diagnosis, and Treatment.

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Bismarck, North Dakota.

The presence of adventitious peritoneal membranes, bands and adhesions in the lower abdomen has been a frequent topic for discussion among abdominal surgeons for a number of years. More recently our attention has been attracted to the pathologic and clinical significance of a somewhat similar condition which is found quite frequently about the gallbladder and the descending portion of the duodenum. These adhesions are sometimes noticed rather incidentally during abdominal exploration, in the absence of any preoperative sign or symptom pointing to the gastroduodenal or biliary tracts. At other times they are found attached to the duodenum, pylorus, cystic duct, or gallbladder in such a manner as to indicate definitely that they have had a causative influence on the symptoms, for the relief of which the patient is being operated. In the latter case it is essential for the best postoperative results that the surgeon be well informed both about the pathologic anatomy involved and about the therapeutic methods available for the patient's relief. The medical diagnostician also must keep these abnormalities in mind during the examination of patients with epigastric symptoms or his conclusions will not always be based on sufficient premises.

Among the many who have added instructive chapters to our knowledge of abnormal peritoneal membranes, Bryant[1] made a very important contribution by his postmortem examinations of some 300 subjects, including all ages from the prenatal to the senile. He found abnormal peritoneal bands and adhesions existing in all of the eighteen male and in fourteen of the sixteen female fetuses examined. After birth there was a general decrease in adhesions until about the age of forty when a definite increase seemed to take place. But his most important observation, to my mind, was the fact that most of these abnormalities in the fetus were located in the right upper abdomen, i. e., on the gallbladder, duodenum, and transverse colon. Bryant concluded that this is due to a failure of normal disappearance of the anterior primitive mesentery at the time when the lesser omentum and the gastrohepatic ligament are being formed.

The duodenum is affected by the dextrad rotation of the upper abdominal organs probably more than any other organ concerned in this prenatal readjustment[2]. Its entire right surface and the lower half of the left become permanently attached to other structures during the rotation, after having been previously free except for the anterior and posterior mesenteric attachments. The transverse mesocolon and the mesenteric root attach themselves more or less tightly across the front of the duodenum while the posterior surface becomes adherent to the back. The colon seems to be erratic in its efforts to become attached in the right upper abdomen and often clings to the duodenum so tightly during the rotation that it is unable to let go at the proper time. As a result many individuals go through life with the cecum and ascending colon hanging from fibrous attachments on or about the second portion of the duodenum (Fig. 4, C).

During the colonic rotation in the fetus the transverse mesocolon does not always become attached across the duodenum at the same distance from the pylorus. Patients with severe digestive disorders are seen from time to time in whom the duodenal segment of the intestine is found by fluoroscope, or by exploration, to be excessively long (Figs. 1 and 2). The second portion producing a zigzag or loop formation above the mesocolon, not only seems to be of an abnormal length, but the third portion also may be seen to form an unusually long curve below the mesocolon. Haberer[3] called attention to this submeso-

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 17-19, 1926.

colic duodenal abnormality, but he did not mention its occurrence above the transverse mesocolon. As a rule we do not examine healthy individuals and we do not know how often such abnormalities may be compatible with symptom-free digestion. But some measure of clinical significance must be ascribed to my observation that certain operative procedures serving as physiologic relief for unusually long and obstructed duodenal loops will remove epigastric distress and restore patients to digestive health.

stated positively whether or not the later introduction of bacteria into the intestine and the absorption of their toxins from a retention in a duodenal loop add materially to the local pathology, but we may safely assume that bacterial toxins help to increase the toxemic symptoms produced by a fully developed duodenal retention.

With all these facts before us it is easy to visualize the possibility of a congenital origin of a duodenal disfunction which later may cause re-



Fig. 1. Essential periduodenitis deforming the entire supramesocolic duodenum; abnormal length of duodenum producing a loop toward the right above mesocolon; epigastric distress, anorexia, loss of weight, bile emesis; disappearance of all symptoms after transmesocolic duodenojejunostomy, except occasional nausea after meals.

The development of the digestive juices[4] begins even before birth and their presence and activities are emphasized most strongly in the upper part of the intestine. Clinical and experimental evidence both have shown that toxic substances may be absorbed from the intestinal mucosa and that the toxicity of the duodenal juices exceeds that of any other segment of the entire gastro-intestinal tract. It cannot yet be

tention and irritation and perhaps even infection of the duodenal wall, and consequent interference with the normal development of the duodenal peritoneum.

The term "periduodenitis" is a recent acquisition in medical terminology. Under this name are comprised not only all the abnormal membranes and adhesions about the first, second, and occasionally the third, portions of the duodenum

which are of developmental or infectious origin, but also the postoperative adhesions involving the duodenal serosa. It seems that Professor Pierre

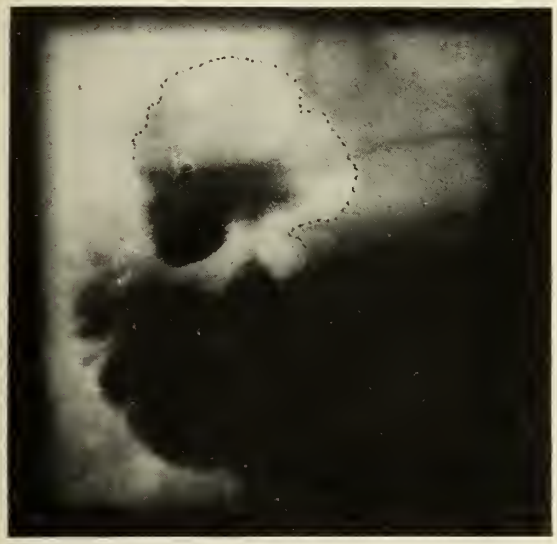


Fig. 2 Abnormal length of duodenum; upper part of second portion forming a loop filled with gas in front of stomach; from patient with marked digestive troubles—resembling duodenal ulcer; relieved from postural treatments (no operation).

Duval of Paris, who first studied these abnormalities extensively, established the term[5]. He also classified the lesion under two main headings and gave the name "pericholecysto-duodenitis," or "biliary periduodenitis," to those cases in which the duodenal adhesions were attached to the gallbladder or cystic duct (Fig. 3). He applied the term "essential periduodenitis" to those cases in which the adhesions, bands, veils, mem-

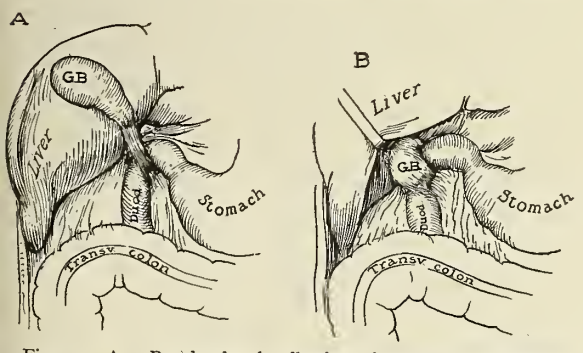


Fig. 3. A. Periduodenal adhesions involving gastrohepatic ligament and deep segment of gallbladder—Pericholecysto-duodenitis.
B. Pericholecysto-duodenitis, extreme degree, gallbladder firmly attached across second portion of duodenum.

branes, or "cob-webs" were found on the duodenum, but not involving the gallbladder or ducts, although extensions of the abnormal structure might reach to the liver, stomach, omentum, transverse colon, or posterior abdominal wall (Fig. 4, A and B). He specified for the "essential" type also that no inflammatory or other lesion of any kind was to be found in the duodenum, gallbladder, pancreas, or other neighboring organs as a possible cause for the adhesions. This division into two types is very convenient for topographic reasons, but it is my belief that in very many instances where there has been no previous operation, the condition is fundamentally one and the same thing, whether the

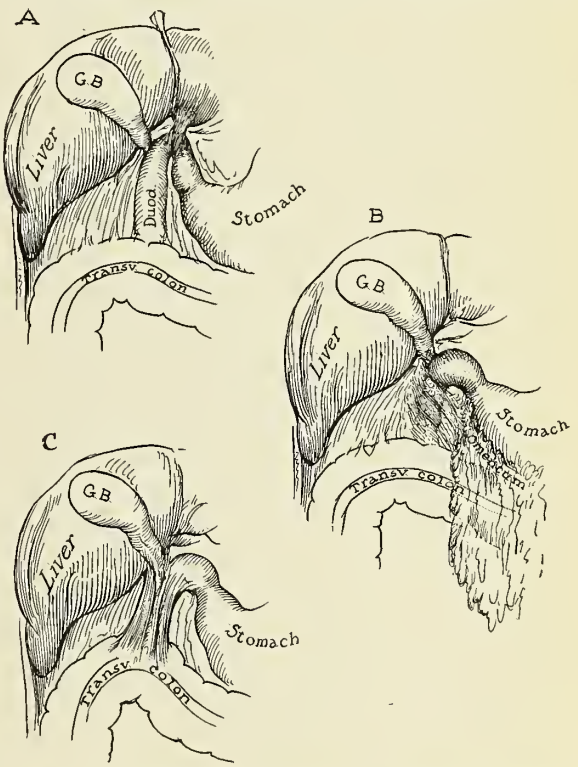


Fig. 4. A. Essential periduodenitis, restricting and stenosing adhesions from duodenal bulb and first portion to liver.
B. Essential periduodenitis, the second portion held in a loose membranous sheath.
C. Thick periduodenal bands forming a ligamentous structure from which the right colon is supported: right phrenocolic ligament absent.

adhesions are confined to the duodenum, or involve the gallbladder or other contiguous structures.

Periduodenal adhesions which appear and produce epigastric symptoms after operations do not properly belong to the pathologic conception of periduodenitis now under discussion. This contribution to the subject is based chiefly on personal observations of periduodenitis of Duval's "essential" type on the first and second portions of the duodenum. He mentioned also a similar condition occasionally found on the third portion

of the duodenum[5]. Its symptoms and signs correspond very closely to those of chronic duodenal obstruction at the mesenteric root, a condition already discribed by me and many others. It does not seem important to differentiate clinically the two conditions, since the treatment is the same for both.

A description of the gross appearance of the periduodenal membranes which are found in periduodenitis is very difficult, for the reason that one rarely sees two patients in whom the tissues concerned have the same arrangement. In some cases there are firm bands uniting one or more small areas of the duodenal wall to the liver, lesser omentum, or posterior abdominal wall, while in other cases the membrane seems to cover the entire descending duodenum with here and there tighter bands causing localized restrictions on the bowel lumen. It is more important to emphasize the clinical significance of their presence than to discuss the many varieties of periduodenal membranes. Although there is a certain similarity between the abnormal membranes found on a hypermobile right colon and those on the duodenum, the former have a more uniform and more purposeful anatomic arrangement, and they are not nearly so restricting and disabling to the function of the intestine as are their periduodenal courterparts[5].

Several cases of essential periduodenitis associated with a marked hypermobility of the pylorus and duodenum have come under my observation. The periduodenal membrane in such patients is exceedingly thin and forms a complete covering or sheath to which the second portion is attached very loosely, permitting exceptionally free movements of the entire supramesocolic duodenum. The membranes in these cases rarely have any connection with the biliary tract. A number of small bright red blood vessels coming from the omental margin run transversely within the sheath and do not appear to anastomose with the duodenal vessels proper. This sheath formation has been present to a lesser or greater extent in all cases of those abnormally long duodena which we have explored surgically.

Since essential periduodenitis must be assumed to be largely of congenital or developmental origin it follows that, as a rule, the symptoms produced begin in early life. An adult patient rarely appears seeking relief for the first time from digestive difficulties which have begun after adolescence. The history usually shows that there had been a series of milder spells of indigestion and epigastric pain, beginning between the fifteenth and twentieth years, or even earlier. On inquiry it is often found that dyspepsia of some form is well known to other members of the family, this again points to an inborn tendency. The female is afflicted more often than the male.

The patient's *symptoms* will indicate in a general way which organic function, or functions, suffer most from the adhesions[5 6 7 8]. When these are locatel chiefly about the gallbladder and the cystic duct, the clinical picture may be impossible of differentiation from those of cholecystitis. If the pyloric region is chiefly involved the syndrome resembles that of duodenal or gastric ulcer. Symptoms which may be called typical of periduodenitis are produced in some cases in which the membranes are confined to the descending duodenum. But even though the symptoms are very suggestive in such cases, a positive preoperative diagnosis of periduodenitis is not to be expected in any case without the aid of expert roentgenologic knowledge.

Some patients have definite attacks of pain in the right upper abdomen, often radiating toward the back as in disease of the biliary system[5]. The pain and distress may last several days and be followed by periods of good health. However, a carefully taken history will show that the symptoms are not so severe as in typical gallstone colic; that they last longer; and that they are associated with nausea and often with emesis. After a number of these attacks the patient usually comes to a surgeon and is operated for cholecystitis. At operation the gallbladder is probably found attached more or less firmly to the duodenum with adhesions which seem to confirm the diagnosis of cholecystitis. In accordance with prevailing practice cholecystectomy is made. Postoperative examination of such gallbladders has shown that the muscular and mucous coats may be quite normal and free from the usual signs of infection. There is not the round cell infiltration expected to be present, a few days after an acute attack of true cholecystitis. An increase in fibrous tissue may be present where the adhesions have been cut while the rest of the wall is practically normal.

In cases of firm union between the gallbladder and the duodenum, it is noticed that while the gallbladder is being cut free, the duodenum becomes more and more liberated from the confining bands of adhesions and bulges freely forward. This gives the distinct impression that the adhesions have had a constricting effect on the duodenum, that the duodenal caliber has been definitely reduced, and that normal duodenal function could not take place under the tightly drawn adhesions. In such cases the patient's relief from symptoms after cholecystectomy, if relief there be, is probably due more to the liberation of the constricted and obstructed duodenum than to the removal of the gallbladder itself. It is, of course, understood that this statement has no reference to cases of true infection of the gallbladder in which pericholecystic adhesions are so well known.

Another confusing set of symptoms caused by periduodenal membranes is presented by patients who have distress after meals[5]. The discomfort may be almost as regular as in typical duodenal ulcer. Although the distress may differ from ulcer pain in that no relief is obtained from food or alkalies, it is not possible to rule out ulcer from the clinical history alone. The picture can simulate duodenal ulcer so closely that too hasty diagnosis, especially before the time when competent roentgenologic judgment became available, to my personal knowledge and humiliation, occasionally has led to misdirected surgery.

There are, however, patients who present what may be termed a typical syndrome of periduodenitis of the supramesocolic, "essential" type. The following case history chosen out of several which are more or less similar will serve as a good example:

The patient was a young woman of twenty-four years, a saleslady in a dry goods store. Her father, now dead, had suffered from chronic stomach trouble all his life and had had frequent vomiting spells. As a child, she had a "weak stomach," and at the age of adolescence she began to have occasional "bilious spells," which means that she had attacks of headache, general malaise, nausea, and vomiting of bile. A few years later she noticed a gradually oncoming sensation of fullness in the epigastrium and often nausea after meals. Vomiting of bile had taken place on many occasions. There had never been any real pain in the epigastrium, but the distressing sensations of fullness and nausea, seemed to increase in frequency and intensity. Constipation had required the constant use of laxatives during the last three years. The taking of an enema always produced emesis.

But more disabling than any of the symptoms described were attacks of severe headaches which had appeared three or four years ago and had gradually become more intense. These headaches came every two or three weeks and were described by the patient as "blinding" in character, her vision each time becoming entirely blurred for hours. The headache always wound up with nausea and emesis and was followed by general weakness and malaise for several days. In the past few months she had noticed a painful stiffening in her joints, especially in the lower extremities. She was depressed mentally, introspective, and suffered from insomnia.

She was obliged frequently to leave her work and go home to bed, chiefly because of the headache which did not respond to any form of treatment. She had consulted a number of medical advisers, charlatans among the rest, but all treatments, including an appendectomy, had failed to stop the progress of her ailments.

The physical examination of this patient with such a definite history of chronic digestive disturbance was remarkably negative. Her appearance was somewhat anemic, otherwise normal. The only abnormality found by palpation was a tenderness in the right hypochondrium, and a hypermobile right colon. Examinations of gastric juice, urine, and blood showed nothing abnormal except a slight secondary anemia. Definite information was given, however, by means of fluoroscopic examination, and the positive x-ray findings together with the characteristic clinical history led to proper diagnosis and successful operative treatment.

The history related above brings out the two most important clinical signs of essential periduodenitis, namely: first, retention of the duodenal contents, producing local discomfort, nausea and emesis, and second, evidence of a toxemia as shown by the headaches and other general symptoms.

Toxic absorption from duodenal retention seems to be especially prone to bring on symptoms of a nervous nature[5 8]. Besides the almost uniform complaints of headache, a profound mental depression usually called neurasthenia often takes possession of the patient. The occurrence of multiarticular pains, which together with the other symptoms disappeared soon after operation, was an observation in the case reported not seen in any other instance, but it indicates the toxic effects of retained duodenal contents.

It should be kept in mind that the symptoms, both local and general, are produced by the abnormal retention within the duodenum of a quantity of toxic material beyond the physiologic time for emptying.

Clinical experience leaves no doubt that the presence of abnormal adhesions on the peritoneal surfaces of the duodenum causes this duodenal disfunction. The perverted and ineffective peristalsis and the abnormal duodenal retention may be visualized by the fluoroscope before op-



Fig. 5. Normal duodenum forcibly distended with barium to show outline.

eration. After the adhesions have been removed or their effects minimized by surgical technic, the duodenum is seen to functionate more normally and the patient's former symptoms disappear.

The duodenum was not intended to be a resting place for anything in particular. It was made for a passageway and not for a store-room. A duodenum able to complete the passage of its contents from pylorus to jejunum in eight or ten seconds produces no discomfort to its owner. A duodenum requiring several minutes for the same act has a dyspeptic owner, while a completely obstructed duodenum causes the owner's death in a few hours.

There are without question other causes for the syndrome of biliousness associated with headache beside periduodenitis and other forms of chronic duodenal obstruction. Certain endocrine disturbances of obscure nature are undoubtedly causative factors in some cases, while in others duodenal antiperistalsis is induced through reflex routes. But with a good understanding of duodenal retention as well as of duodenal ulcer and biliary disease, there will be a very material decrease in the number of cases of hitherto unexplained epigastric disturbances.

In the roentgenologic examination for periduodenitis, observation before the fluoroscopic screen gives the most important evidence of the disease [5] [9]. Films are not nearly so instructive, first, because the barium-filled stomach often overshadows a large part of the duodenum, and second, because it is very difficult to photograph the rapidly changing contours assumed by the duodenum. In the normal duodenum the rapid transit of the contents prevents, as a rule, the formation of any definite shadow in the second and third portions (Fig. 5). In duodenal obstruction, whether from periduodenitis or other cause, the contents are retarded long enough for the duodenal outline to be visualized (Figs. 6, 7, 8 and 9). In some cases it may be found that



Fig. 6. Duodenal obstruction at mesentric root; no periduodenal adhesion; duodenum evenly distended; constant nausea, and frequent attacks of bile emesis cured from submesocolic duodenojejunostomy.

the duodenum is more or less filled throughout the period of gastric emptying. In periduodenitis energetic peristaltic and antiperistaltic movements are noted and points of abnormal and permanent fixation may be located. The duodenum seems to struggle against the restricting fibers and membranes, suggesting the movements of a fish caught in a landing net. In our experience

every duodenum which presented these struggling or writhing movements, and in which surgical exploration was made, abnormal membranes were found on the second portion, or on the first and second portions.

For accurate diagnosis and proper treatment of periduodenitis, an understanding and cooperative interest from the roentgenologist is a necessity. The internist can at best make only a tentative diagnosis of periduodenitis and duodenal retention in typical cases. It lies within the domain of roentgenology to clear up the confusion and to make the diagnosis fairly exact in the majority of cases. Very few roentgenologists have as yet acquired the necessary knowledge for this work. Perhaps this is our own fault. When the surgeon, and more especially the internist, begins to make more specific inquiries into the finer details of the duodenal appearance and behavior before the fluoroscopic scheen, the roentgenologist will soon fall into line, and if he is the right sort, he is apt to becomethe leader in the search for evidence of periduodenal adhesions and of pathologic duodenal retention.



Fig. 7. Pericholecysto-duodenitis; gallbladder found tightly adherent across duodenum; note deformity of bulb and nearly complete stenosis.

So far as *treatment* of this condition is concerned, it makes little difference whether we consider the periduodenal adhesions of developmental or of inflammatory origin, or indeed if we assume that they are but end products from chronic stasis in the colon, as certain authorities would have us believe. Experience has proved abundantly that the local periduodenal lesion is real, that it causes the local and general disturbances above mentioned, and that proper treatment of the local lesion does restore patients to health.



Fig. 8. Essential periduodenitis, second portion entirely covered with membrane; side view; frequent headaches, periodic attacks of distress after eating, emesis of food remnants, no bile; free from all symptoms after transmesocolic duodenojejunostomy.

Since the pathogenic cause is primarily of a mechanical and obstructive nature, it follows that mechanical relief of the obstruction must be the main feature of any rational treatment. Prolonged rest in bed with restricted diet will afford a temporary relief in certain cases, but as a rule all former symptoms recur when the patient resumes the former mode of living. The absence of relief from epigastric trouble when the patient is put to bed in the Trendelenburg position is a characteristic which helps, in some cases, to differentiate periduodenitis clinically from chronic duodenal obstruction near the duodenojejunal junction. Postural treatments combined with abdominal pads and belts give more

or less lasting relief to the latter condition, while periduodenitis, especially of the supramesocolic type, remains uninfluenced by every change of position of body or of viscera as well as by any and all forms of internal medication.

It must be understood that while periduodenitis is of common occurrence, comparatively few have serious symptoms due to this lesion. In most cases of mild and temporary spells of sickness from this cause, medical, dietary, and palliative means alone are to be considered. But when the condition appears progressive and disabling, when the toxemic symptoms become severe, and when the x-ray has shown positively the duodenal disfunction, then surgical treatment is indicated. It should be stated also that the mere presence of periduodenal adhesions is not an indication for surgical treatment. Neither does the x-ray diagnosis by itself necessarily point to operation. Surgery should be thought of only when the clinical syndrome is of sufficient gravity to warrant radical interference.



Fig. 9. Essential periduodenitis, upper part of second portion stenosed from restricting bands and membranes (see clinical history in text; transmesocolic duodenojejunostomy; cure).

Before operating for periduodenitis it is necessary that the surgeon be well experienced in abdominal work and have thoroughly informed himself about the problems that will be encountered and the technical means to overcome them. Here, as in many other fields of medicine, no two cases seem to be exactly alike and much judgment must be exercised in choosing the proper form of treatment for the individual case.

The surgical technic followed in my work has been in the main that described by Professor Duval. I have deviated from his methods only in some minor points, the most important of which has been perhaps the use of attached omental flaps instead of free grafts as practiced at his clinic.

It had been my practice for many years to make use of omental flaps as a protection against a possible formation of adhesions in nearly every case of cholecystectomy. This technic required but slight modification to conform to the requirements of covering the denuded areas on the duodenum when operating for periduodenitis. It would seem also that whenever the attached flap is available it would offer a better assurance against faulty healing.

In secondary operations for periduodenitis following cholecystectomy, the adhesions have been loosened until the duodenum has become freely mobilized, after which the duodenal raw surfaces have been covered with attached omental flaps. In a few such cases with extensive adhesions about the pylorus and first portion of the duodenum, gastroenterostomy has been made. One patient, a woman of 57, who had been operated twice elswhere for duodenal adhesions after a primary cholecystectomy, and who had duodenal stasis, was treated with a gastroenterostomy plus a duodenojejunostomy according to Duval's method. She was a feeble invalid, suffering pain from the extensive adhesions, and headache and melancholia from the duodenal toxemia. She has enjoyed good health almost without interruption since the operation, nearly two years ago.

In cholecystic periduodenitis with the gallbladder still present, cholecystectomy has been made in all cases when the adhesions involved the greater portion of the gallbladder serosa and the liberated duodenum has been covered with omental flap. In a few similar cases where the adhesions covered only the deeper parts of the gallbladder and the ducts, or where a rather thin membrane extended to the mesial surface of an otherwise normal gallbladder, this organ was left *in situ* and the attached omental flap applied to cover the duodenum (Fig. 10).

The observation that certain adherent gallbladders may be dissected away from the duodenum and re-adherence prevented by the interposition of an omental flap and that painful

symptoms in the right hypochondrium can be cured by this rather simple treatment, has reminded me of a number of excised gallbladders which might have been preserved by this method. It also calls attention to the fact that some pericholecystic adhesions may be induced by causes entirely outside the biliary system.

In some cases of long standing obstruction and retention from cholecystico-duodenal adhesions, the duodenum seems to be unable to resume its normal emptying function, even after it has been freed, mobilized, and protected by intervening flaps. In such cases duodenojejunostomy is indicated. This is the operation recommended also in all cases of "essential" periduodenitis of the supramesocolic type when the disease is sufficiently disabling to warrant surgical treatment.

On former occasions it has been my privilege

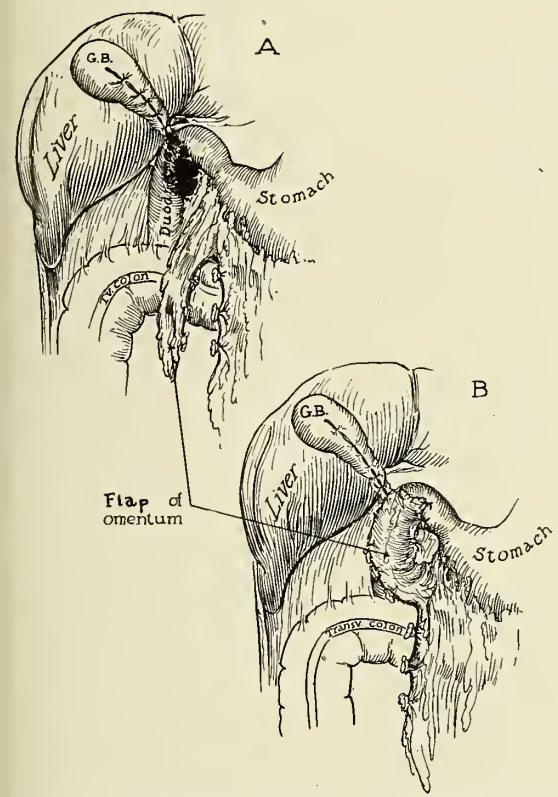


Fig. 10. A. Gallbladder freed from its periduodenal adhesions; preparation of omental flap.
B. Application of attached omental flap.

to call attention to the usefulness of duodenojejunostomy as a short-circuiting operation in cases of chronic duodenal obstruction near the duodenojejunal junction[10]. The operation then described consisted of an anastomosis between the jejunum and the third, or submesocolic, portion of the duodenum. This technic has proved satisfactory also in cases where periduodenal adhesions were limited to the submesocolic part of the duodenum. But this operation does not drain the duodenum satisfactorily in supramesocolic periduodenitis, which is by far the most frequent

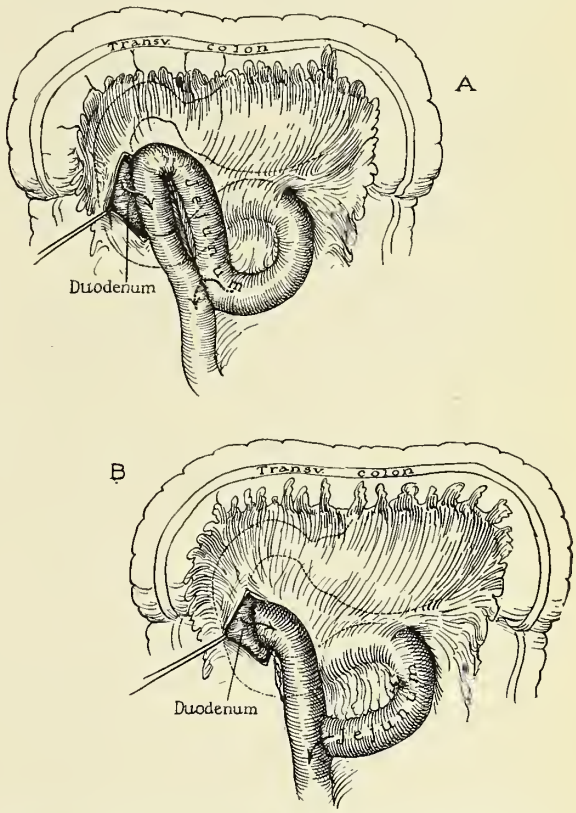


Fig. 11. A. Duval's transmesocolic duodenojejunostomy and supplementary jejunojejunostomy.
B. Same operation with Gregoire's technic.

and important type. In these cases the anastomosis must be made on the second portion of the duodenum. After the duodenum has been freed from its restricting bands and membranes a jejunal loop is passed through an opening made in the transverse mesocolon exactly as in posterior gastroenterostomy, but with the additional feature that the loop is also passed through an opening made under the right border of the omentum at the duodenal margin. An anastomosis is then made between the jejunal loop and the duodenum in front of the pancreas. The opening in the mesocolon is sutured to the jejunum to prevent herniation. In some cases with freely movable duodenum, the mesocolic opening may be sutured directly to the duodenum. When that cannot be done, a short-cir-

cuiting jejunojejunostomy must be done or a jejunoduodenal vicious circle might take place (Fig. 11, A). Duval lays stress on this supplementary anastomosis in all cases of supramesocolic duodenojejunostomy, while Grégoire advises a jejunal "Y" anastomosis (Fig. 11, B). It is my opinion that Grégoire's technic is the most rational, although I have not practiced it for the reason that in my hands it cannot be done as cleanly as the other. Because of the unusual length and mobility of the duodenum in several of my cases, the supplementary jejunal operation has not always been made. The additional anastomosis is probably necessary in the majority of the cases.

Duodenojejunostomy for periduodenitis by transmesocolic methods has been made by me on ten patients—four males and six females. Their ages ran from 22 to 45 years. The outstanding symptoms in all these patients were headaches, epigastric pain after meals, nausea and bile emesis. The duration of the disease had been "from childhood" in four patients and from five to fourteen years in the other six. Medical, postural, and dietetic treatments were tried in all cases before operation was advised.

Although the time has been too short for final judgment (the first operation having been made less than two years ago), the results to date have been highly satisfactory. Some of these patients are today my most enthusiastic friends, because of their freedom from dyspepsia and pain, and their ability to eat, work, and enjoy life.

The younger patients have been relieved from their symptoms through operation much more promptly and definitely than those who were older. The epigastric pain, and also the headaches and other signs of toxemia, disappeared in practically all, but sensations of nausea and fullness after meals were not entirely removed in some of the older patients. The two oldest patients, both female, aged 41 and 45 years, had the least satisfactory results. It would seem that after the duodenum has practiced antiperistalsis for many years, it becomes increasingly difficult to stop the habit, even if there be no apparent exciting cause present. The fluoroscope has shown in such cases that the sensation of nausea and epigastric distress corresponds to the time of the duodenal antiperistaltic waves, the same as it does in patients before operation.

REFERENCES

1. Bryant: Am. Jour. Med. Sc., 1922, 163, 75, and 1923, 165, 111.
2. Huntington: Anatomy of the peritoneum and abdomen.
3. Haberer: Arch. f. Klin. Chir., 1924, 132, 191.
4. Keibel and Mall: Human embryology.
5. Duval, Roux and Béclère: The duodenum—Medical, radiologic, and surgical studies. (Translation soon to be published by Mosby & Co., St. Louis.)
6. Duval et Gatellier: Arch. Fr.-Belg. de Chir., Jan. 1925, 28, 1.
7. Whitacre: N. W. Med., Apr. 1925, 24, 113.
8. Niles: Am. Jour. Med. Sc., March 1925, 169, 328.
9. Ratkoczi: Am. Jour. Roent., 1924, 12, 146.
10. Quain: N. Y. Med. Jour. and Med. Rec., Dec. 6, 1922, 116, 651. Arch. Surg., March 1923, 6, 638. Am. Jour. Surg., Aug. 1924, 38, 193.

LIMITATIONS OF COD LIVER OIL IN RICKETS

Cod liver oil, long recognized as having anthrachitic potencies, has been heralded as a veritable specific, alike for the prevention and the cure of rickets. Under the unfeigned encouragement of the medical profession, child welfare agencies everywhere have preached the doctrine of the liberal administration of cod liver oil in infancy. The public has been informed through numerous channels, including even the legitimate advertising and the sales promoting of manufacturers. In consideration of the protests against the indiscriminate administration of iodine in the prophylaxis of goiter, it may be asked to what extent the promotion of the use of cod liver oil in infancy is on a basis that is defensible from every standpoint. Is it effective? Does it involve possibilities of unsuspected harm? Is it worth while? Should it be modified in any way? Evidence is already available that the highest expectations are not consistently realized. However, the unqualified success obtained with cod liver oil under carefully controlled conditions of many clinicians should give assurance of the wisdom of its inclusion in prophylaxis. What is needed above all at present, is a better understanding of how rickets may be averted in the home as well as in the well ordered clinic. (Jour. A. M. A., June 19, 1926, p. 1912).

THE RELATION OF SUBPERITONEAL FAT TO ABDOMINAL HERNIA*

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The object of this paper is to discuss the more or less known facts concerning subperitoneal fat in its relation to abdominal and pelvic hernia, and the origin and clinical significance of fat in the inguinal canal. I wish to consider the abdomen and the pelvis as one cavity and to define all hernias in any part of the body as displacements and protrusions of a part which has escaped from its natural cavity by some aperature; and furthermore that a sac is not a necessary accompaniment. All forms of hernia are due, in order of importance, to (1) weakness of support; (2) pressure from within, and (3) traction from without. The various types of abdominal and pelvic hernias are described according to the openings through which they occur; (1) the internal inguinal ring; (2) Hesselbach's triangle; (3) femoral canal; (4) obturator foramen; (5) greater and lesser sciatic foramina; (6) pelvic floor; (7) superior and inferior lumbar triangles; (8) vascular perforations of the linea alba and linea semilunaris; (9) atrophic areas in the transversalis fascia, lateral to the linea semilunaris; (10) abdominal wounds; (11) umbilical ring, and (12) the abdomino-thoracic diaphragm. The last two, umbilical and diaphragmatic hernias, will not be considered owing to the total lack of subperitoneal fat beneath the inner rim of the umbilicus and the almost total lack of it beneath the diaphragm. I could find no reference to subperitoneal fat preceding these two types of hernias.

The first ten types of abdominal and pelvic hernias occur through openings around which there is a varying amount of subperitoneal fat, loosely attached to the overlying peritoneum and even less so to the underlying tissues. This subperitoneal fat is frequently, and perhaps normally, found projecting into and even through these openings, and no doubt, is occasionally forced or pulled considerably beyond their external boundaries. When such a condition arises the peritoneum may become evaginated and if any viscus or tissue later enters this peritoneal evagination (sac), we then have had in succession three distinct hernias; (1) a hernia, without a sac, of subperitoneal fat; (2) a hernia, of a sac only, of peritoneum, and (3) a hernia, with a sac of peritoneum, containing some abdominal or pelvic viscus.

The fleshier the individual the greater the deposit of subperitoneal fat, the greatest deposits lying along the path of the uro-genital ridge, from the kidney to the crural arch. From here the fat spreads laterally; inwardly to the deep abdominal ganglia and outwardly around to and beneath the anterior abdominal wall. There is always a significant deposit above and below the umbilicus, particularly over the falciform ligament of the liver and in the space of Retzius.

HISTORICAL

The role of subperitoneal fat in abdominal hernia has long been known. Inguinal hernias, according to Garrison, have been operated upon since the time of Hippocrates, but the first mention of fat in the inguinal canal did not occur until the time of Ambroise Pare. From the works of Pare 1564, Morgagni 1704, and Scarpa 1809, one might safely state that our present knowledge of abdominal hernia is based, including hernia of the subperitoneal fat through the walls of the abdomen. Very little of fundamental importance has been added since, excluding the operative cure. Pare first described fatty masses in the inguinal canal and scrotum as attached to the spermatic cord and considered them as adjuncts to intestinal hernia. Morgagni in 1704 stated that Schulzius previously had described inguinal canal lipomata as being mistaken for bubonoceles, and that Petichius thought that fatty tissue in the inguinal canal and scrotum was subperitoneal fat carried out through the internal inguinal rings. Morgagni (Letter 43, art. 10 p. 557), in the first part of the 18th century, was probably the first to accurately describe epigastric hernia as a protrusion only of subperitoneal fat through the linea semilunaris and linea alba. He further stated that such hernias rarely contain a peritoneal sac without additional traction. It is interesting to note that de Garengeot in 1743 (quoting Watson) and Gunz in 1774 (quoting Wernher), stated that epigastric hernia was nothing more than a protrusion of

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the subperitoneal fat through the fused abdominal fascia on each side of the rectus muscle. De Garengeot (quoting Watson), was probably the first to associate gastro-intestinal symptoms with epigastric hernia. Pelletan (quoting Wernher) in 1780 independently described epigastric hernia as Morgagni and Gunz had previously. Through the 19th century and up to the present there have been a few reports of importance of herniated subperitoneal fat through the epigastrium, more or less accurately and inaccurately described. It is very evident from the literature that the above quoted observers have received very little attention and that the subject of subperitoneal fat in its relation to all abdominal hernia has not received its due consideration. From the attached bibliography I can recommend the works of Pare, Morgagni, Gunz, de Garengeot, Cooper and Watson. The treatise on hernia by Watson is a mine of information and I wish to acknowledge appreciation for many of my references.

INGUINAL HERNIA

The vaginal tunic of the spermatic cord and testicle is merely a constricted portion of the peritoneum. Contrary to general opinion, it was not pulled into the scrotum by the descent of the testicle. The scrotum is merely an evaginiation of a portion of all of the layers of the lower anterior wall, including the peritoneum. Therefore, the tunic of the cord and the testicle preceded the testicle; it is nothing more than abdominal peritoneum. In the condition known as undescended testicle, we generally find the peritoneal sac extending lower than the testicle. This proves beyond all doubt that the evaginated abdominal peritoneum preceded the testicle into the scrotum. The mesothelial tunic of the testicle and of the cord, therefore, must be looked upon as nothing more than abdominal peritoneum with all its characteristics. A rare example of the tunica vaginalis resembling the abdominal peritoneum is demonstrated by a case of mine in which I found a small fatty tumor beneath the tunica vaginalis testis and above the tunica albuginea. On dissection I found this lipoma more intimately attached to the former, and it was nothing more than subperitoneal fat beneath the mesothelial coat of the testicle. The most marked characteristic of subperitoneal areolar tissue is favoring a deposition of fat within it, which is beautifully shown by the work of Gage. If this is true above the internal ring, why is it not true below it. We frequently see "subperitoneal" fat attached to the spermatic cord during operations for hernia, and if it reaches a size large enough to be called a lipoma it is incorrectly looked upon by some as a fatty hernia. Petichius in the early part of the eighteenth century advanced the theory that the fat

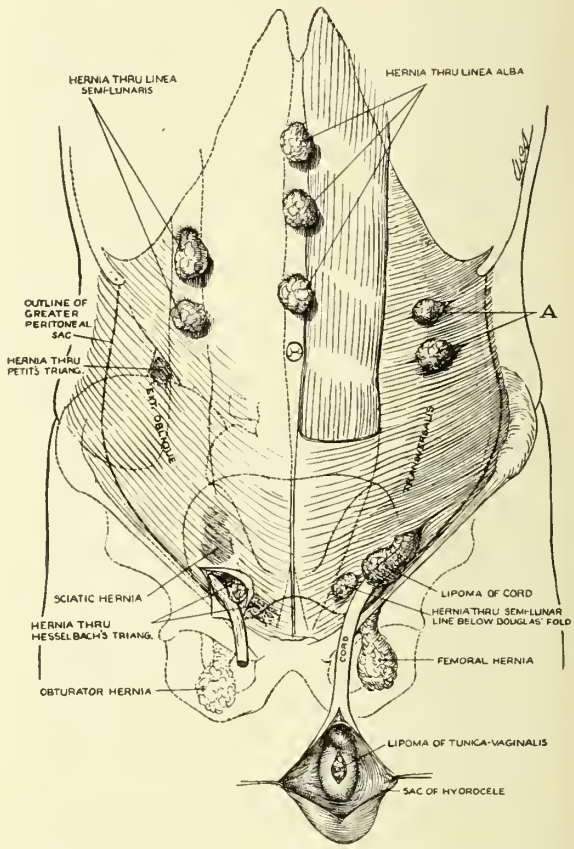


Fig. 1. The openings in the abdominal and pelvic walls through which subperitoneal fat herniates. Note "subperitoneal" fat beneath the tunica vaginalis testis.

covering the cord came from above the internal ring and was carried, or herniated, downward later; and this has been the prevailing view, more or less since. Scarpa, however, felt that the vaginal process of the cord, similar to the abdominal peritoneum, favored the development of fat on its external surface and that these fatty deposits along the cord were not transplanted subperitoneal fat. This idea was remarkable owing to the fact that he long ante-dated all embryologic studies. It seems logical to assume, therefore, that the inguinal subperitoneal areolar tissue as well as the abdominal favors the deposi-

tion of fat; and that fatty masses in the inguinal canal, no matter how large, should, generally, not be looked upon as fatty hernias. If these fatty masses were originally above the internal inguinal ring, and it could be proven (which is inconceivable) that they herniated through the in-

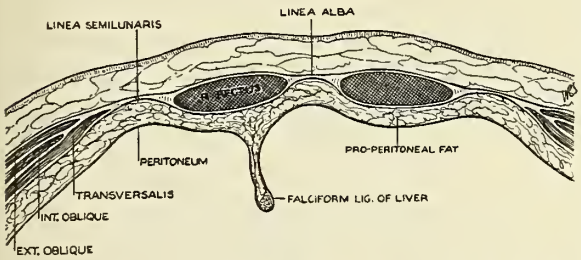


Fig. 2. The fused aponeuroses on each side of the recti muscles. Through these areas branches of the deep epigastric arteries penetrate, presenting openings through which subperitoneal fat herniates.

ternal ring, or any other portion of the floor of the inguinal canal, they could then properly be termed fatty hernias. In most instances, fat attached to the vaginal process of the cord, extends through the internal ring and joins the subperitoneal fat; and as frequently stated by the older writers, this continuous mass of fat, may from traction or active guiding, evaginate the peritoneum through the internal ring into which sac a viscus may be forced. This is a point most worthy of attention in order to prevent recurrences after operations for indirect inguinal hernia. In all operations for indirect inguinal hernia what fat there is along the cord should be carefully removed up to and beyond the internal ring. This will reduce the size of the cord within the repaired internal inguinal ring, resulting in a much firmer support. In numerous recurring indirect inguinal hernias I have found during the second and even the third operation that the subperitoneal fat along the cord and within the internal ring had not been previously removed. I am partial to the view that this fat may be a factor in causing recurrences. Sir Astley Cooper speaks of fat in the inguinal canal extending through the internal ring, which when absorbed during emaciation, relaxes the ring and thereby favors hernia. Pare reports a large inguinal hernia cured by a deposit of fat in the inguinal ring, correlating his clinical deductions with a necropsy. This fat after long pressure from a supporting bandage, became inflamed, and attached itself firmly to the margins of the ring. Could that not occur, under similar conditions, with the modern truss? Fat, however, within the internal ring contributes very little support to the tissues above, and it might well be looked upon at least as a potential, if not an actual, point of weakness. Small inguinal indirect hernias have been known to disappear for a time after the patient has increased in weight, due no doubt to an increased deposit of fat within and above the internal ring; but one could hardly consider this a firm support. A palpable fatty mass in the inguinal canal with or without the presence of an indirect hernia should indicate that the cord is quite likely surrounded by a thick layer of subperitoneal fat which extends through the internal ring and into the subperitoneum.

Saccular hernia through Hesselbach's triangle not infrequently contains a thick layer of subperitoneal fat surrounding the sac. The urinary bladder, owing to traction or guiding from a prevesical lipoma, which is subperitoneal fat, is fre-

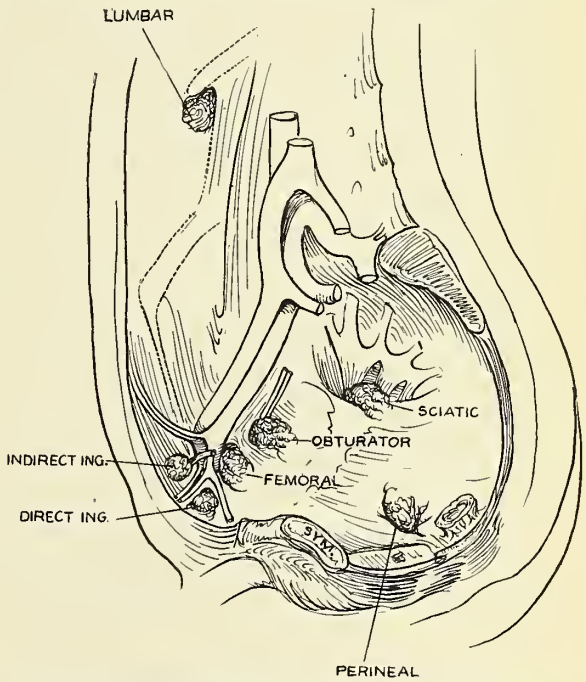


Fig. 3. The pelvic wall stripped of peritoneum showing the various openings through which subperitoneal fat herniates.

quently drawn through the direct inguinal hernial opening, producing a bladder hernia alone, or in addition, a peritoneal sac into which a viscus may be forced. This subperitoneal fat (prevesical lipoma) so obscures the bladder that the latter occasionally is injured during an operation.

Additional evidence as to the value of the traction theory of hernia is a case of ureteral hernia through Hesselbach's triangle reported by Watson; two lipomata, no doubt of subperitoneal origin, preceded the ureter. Surely pressure alone could not have forced the ureter out of the abdominal cavity if the subperitoneal lipomata had not been present to receive the intra-abdominal pressure and to act as a tractor or a guide.

SLIDING HERNIA OF THE SIGMOID

Subperitoneal fat, in a significant proportion of sliding hernias of the sigmoid, appears to be one of the etiological factors. It is interesting to note that Scarpa stated that oftentimes, if present, the inguinal fat, through tension, prevents the reduction of this hernia. I could find no reference to the subperitoneal fat within the inguinal canal, when connected with the subperitoneal fat attached to the extra-peritoneal surface of the sigmoid, as being a factor in producing, through traction or guiding, a sliding hernia of the sigmoid. In three of my own cases of sliding hernias of the sigmoid, I found a taut band of fat, naturally in areolar tissue, extending from the lower part of the inguinal canal up to and firmly attached to the non-peritoneal surface of the sigmoid, which prevented reduction into the abdomen. I feel that this fat, because it was taut, had gradually pulled the non-peritoneal surface of these sigmoids around and through the internal ring. If it did not pull them through, it certainly formed a guiding path. As Poynter states, a predisposition to sliding hernia of the sigmoid is its congenitally low lying position, with its non-peritoneal surface close to the internal ring. A direct band of fat attached below cannot help but act as a tractor or guide. In operating upon these hernias all fat should be stripped from the upper cord, internal ring, and extra-peritoneal surface of the bowel.

FEMORAL HERNIA

The sacs of femoral hernias are nearly always covered by a thick layer of fat, and rarely does one find a sac without abnormal traction on the part of the surgeon. The subperitoneal fat produced the tumor or so called femoral hernia, and if a peritoneal sac is present, without traction by the surgeon upon the femoral lipoma, it is generally of negative significance and rarely contains intestine. In the majority of instances when intestine does pass through the femoral canal it becomes strangulated, or irreducable. Most so called femoral hernias, therefore, are nothing more than herniated subperitoneal fat. Poynter states that in the dissecting room, the femoral canal frequently and normally contains subperitoneal fat, which might be looked upon as a predisposition to femoral hernia. The characteristic thrill produced over a femoral hernia, in coughing, is generally due to the transmission of a wave through subperitoneal fat, which of

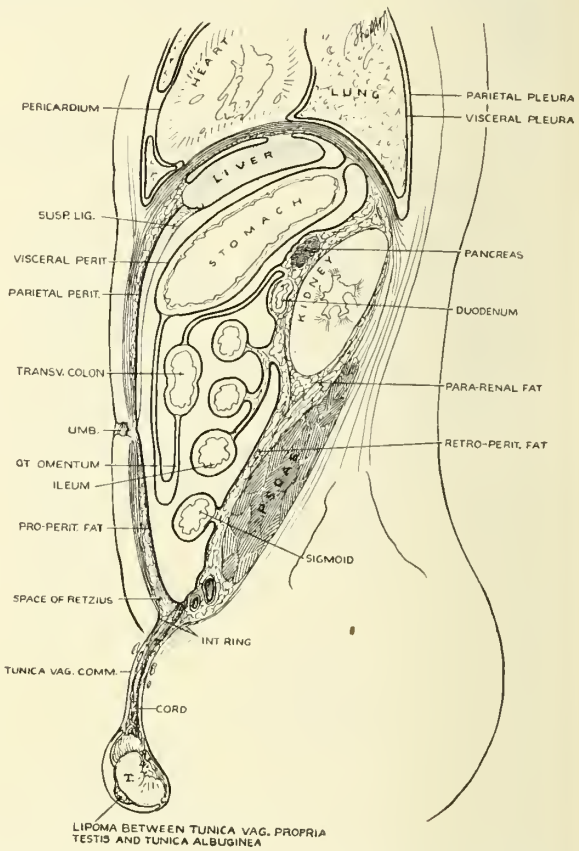


Fig. 4. Cross section of the peritoneum through the mid portion of the psoas muscle. Note the deposit of subperitoneal fat extending into the scrotal peritoneum.

course is directly connected with the fat over the femoral hernia. Removing the fat, thereby obliterating traction, as a rule cures the so called femoral hernia, which rarely is accompanied by an evaginated peritoneum or sac.

OBTURATOR HERNIA

Obturator hernias are rare and as Watson states are sometimes due to traction from subperitoneal fat. Gerdes (quoting Watson) found a large lipoma preceding an obturator hernial

sac. Deep lipomata presenting in the upper portion of Scarpa's triangle may be attached to or originate from the subperitoneal fat passing through the obturator canal.

SCIATIC HERNIA

The extremely rare hernias through the greater and lesser sacro-sciatic foramina known as

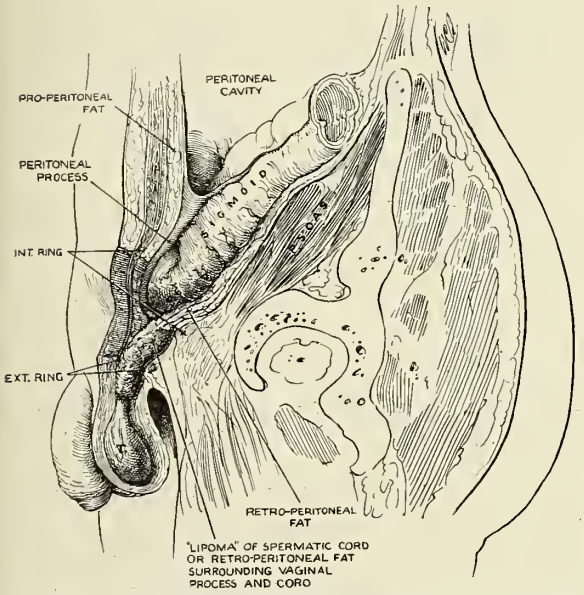


Fig. 5. Cross section of the peritoneum through the internal inguinal ring. Note the subperitoneal fat beneath the sliding hernia of sigmoid, extending downward into the scrotum.

sciatic and ischiatic hernias, may be preceded by descent through these openings of subperitoneal fat. The deep lipomata of the buttox, so difficult to remove completely and not infrequently recurring, may be nothing more than hypertrophy of subperitoneal fat extending through the sciatic foramina into the deep tissues of the buttox.

PERINEAL HERNIA

Perineal hernias have been found to be preceded by a lipoma, quite likely of subperitoneal origin. These hernias descend between the vagina and rectum in females and the bladder and rectum in males. Occasionally they descend through an opening in the levator ani (Watson).

LUMBAR HERNIA

Herniation of subperitoneal fat through the superior and inferior (Petit's Hernia) lumbar triangles has been observed. Watson quotes Morestin who states that fatty hernias occur through slit-like openings in the lumbar fascia. He also states that Hutchinson, Lejars, Demoulin and Turner have reported cases of fatty lumbar hernias in which no sac existed. Such hernias he feels are projections, through the supporting structures of the lumbar region, of subperitoneal lipomata.

LATERAL ABDOMINAL HERNIA

I have never seen a hernia of subperitoneal fat through the transversalis fascia external to the linea semilunaris. Dr. C. W. M. Poynter has found them repeatedly in the dissecting room and feels that they are due to atrophic or congenitally weakened spots in the transversalis fascia. One naturally wonders if lateral abdominal pain may be due occasionally to this type of hernia, particularly if a nerve trunk has been impinged.

EPIGASTRIC HERNIA

The so called epigastric hernias are, as Morgagni in the early eighteenth century stated, protrusions of subperitoneal fat through the vascular openings in the linea alba and linea semilunaris. A similar type of hernia occurs, but less frequently, below the umbilicus. As Scarpa stated, traction by the surgeon may evert the peritoneum, thereby producing a sac, which did not exist before. These original observers felt that gastro-intestinal symptoms were occasionally produced by these fatty hernias in the epigastric region. They are, however, generally of

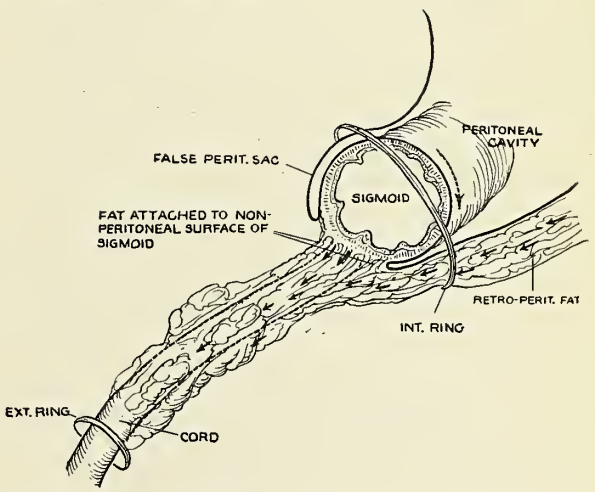


Fig. 6. The nonperitoneal surface of the sigmoid being pulled or guided through the internal ring by the subperitoneal fat of the spermatic cord.

negative significance and should be ignored unless they become tender from strangulation. Brown in several instances found the accompanying artery thrombosed, which he feels may be the cause of reflex gastro-intestinal symptoms. In the majority of instances, when troublesome

gastro-intestinal symptoms accompany epigastric hernia, no relief of the gastro-intestinal symptoms is obtained from the herniotomy. My small number of operations for eradicating epigastric hernias, whether or not they were inflamed or tender, gave no relief and were followed by secondary intra-abdominal operations for the primary complaint. Intra-abdominal pressure is the main cause of these hernias; Hardie reporting two cases in which epigastric hernias immediately followed external force to the abdomen.

ABDOMINAL WOUND HERNIA

Post-operative hernia may be caused by protrusions of subperitoneal fat through the stitched edges of the abdominal muscles and aponeurosis. The transversalis fascia as a rule cannot be stitched separately and accurately enough to withhold the fat from projecting, in areas, toward the surface of the wound. I have had two post-operative hernias, from my own work, occurring in fleshy individuals within 10 days following a celiotomy. In each instance an immediate repair of the wound was necessary, at which time the principal part of the post-operative hernias was subperitoneal fat which had forced itself through the previously stitched recti muscles and aponeurosis. I am inclined to feel that this fat was the primary factor. There is a possibility of numerous post-operative hernias being started in this way and not discovered until long after the operation. During the dissection of old post-operative hernias, not due to infections, I have frequently noticed a firm union between the subcuticular and the subperitoneal layers of fat. This quite likely was due to the projection of portions of subperitoneal fat through the muscles and aponeurosis before they became united. In many instances while cutting through weak, thin and old abdominal scars from previous operations, and not looked upon as post-operative hernias, I have found the subperitoneal fat extending through openings 1 to 2 centimeters in diameter in the abdominal aponeurosis, and united with the subcuticular fat, the edges of the rectus muscle being completely separated. As one of the etiological factors in post-operative hernias, the protrusion of subperitoneal fat through the abdominal muscles and aponeurosis may be safely given more consideration.

SUMMARY

Subperitoneal fat which is embedded in areolar tissue, is loosely attached to its limiting walls, the peritoneum and the structures external; and it can easily pass through the various openings

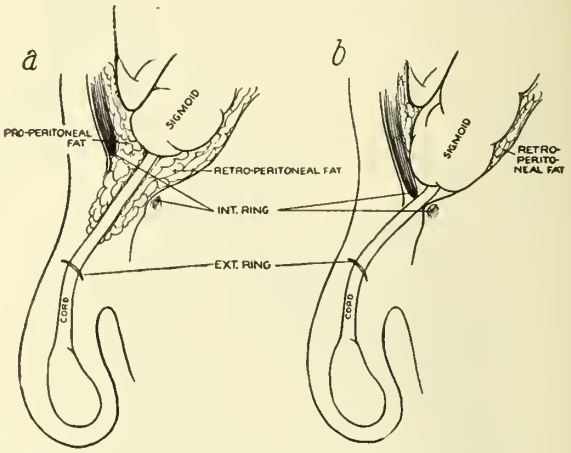


Fig. 7. The subperitoneal fat of the spermatic cord and around the nonperitoneal surface of the sigmoid, removed, and the internal ring closed.

leading from the abdominal and pelvic cavities. The constant, and frequently marked, intra-abdominal pressure is perhaps the most frequent etiological factor. In the deposition of this fat, the various canals and openings from the abdominal and pelvic cavities may become filled with it and deposits may even take place beyond their outer borders. In either event, whether forced through or simply thereby deposited, it becomes more or less attached to structures outside of the abdominal and pelvic cavities; and if traction upon this fat occurs it may pull additional fat through. If the fat becomes neoplastic or hyperplastic, the outside structures have additional tissue to which they can become attached, thereby increasing traction. Later peritoneal sacculation may occur into which abdominal and pelvic viscera may be forced. The opposite view in many instances may be taken, that subperitoneal fat, filling the various openings leading from the abdominal and pelvic cavities, prevents intra-abdominal pressure from evaginating the peritoneum, thereby preventing hernia.

Fatty masses in the inguinal canal should be looked upon as merely subperitoneal fat laid down normally on the outer surface of the scrotal peritoneum (vaginal processes of the spermatic cord and of the testicle). This fat practically always extends upward and through the internal

inguinal ring to join the abdominal subperitoneal fat. Perhaps the percentage of our operative cures for indirect inguinal hernia might be increased if all of this fat along the spermatic cord and within the grasp of the internal ring is carefully and thoroughly removed in order to allow a better closure of the internal ring. The role of subperitoneal fat in sliding hernias of the sigmoid deserves some attention; and furthermore, subperitoneal fat as one of the primary factors in early and late post-operative hernias is a possibility.

BIBLIOGRAPHY

Albert: Lehrb. d. Chir. 3 S. 148-299, 1882.

Alombert, Goget: These Lyons, 1887.

Annandale, Thos.: Med. Chir. Soc. Edinburgh, Jan. 5, 1870.

Aronheim: Monatschr f. Unfallheilk, 1905.

Beclard et Cloquet: Bull. de la Faculte de Med. de Paris et de la soc. Etablie dans sou soin. No. 2, 1816.

Bland-Sutton, J.: Tumors, innocent and malignant-4th Ed. 1906.

Brunner, F.: Deut. Ztschr. f. Chir. Leip., 47, 121. 1889.

Bigot: Sur les tumeurs graisseuses exterieures au peritoine qui peuvent quelquefois simuler de hernies, Paris. 1821.

Bigot: De le hernie etranglee et tumeurs peri-abdominales qui la simulent. Paris, 1850.

Brown, A. J.: Nebr. Med. Jour. Jan. 1923.

Busch, S. W.: Topogr. Chir. S 89. 1869.

Callisen: Systema Chir. Hodiernae 2. 145. 1800.

Cloquet, Jules: Rescherches sur les causes et l'anat. des hernie de l'abdomen, 1819.

Cooper, A. P.: Treatise on hernia, 2 Ed. 1827.

Cruveilhier: Essai sur l'anat. path. gen. B. 2, 1818.

Curling: Treatise diseases of testicle. 1856.

Curling: Todd and Bowmans Ency. Anat. & Phys. Diseases of Testicle, 4th Ed., 1878.

Delafield & Prudden: Path. Anat. and Hist. 441, 1904.

Denonvilliers: Bull. de la Soc. Anat. Paris 304, 1842-1843.

Demoulin, A.: Courrier Med. Paris, Ll. 273, 1901.

Dekkers, Fr.: Med. Doct. exercitat. practical, Lugd., Bat. 150, 1695.

Douglas, K. M.: Trans. Med. Chir. Soc. Edin. N. S. 9, 83, 1889-90.

De Garengeot, R. J. C.: Mem. Acad. Roy. de Chir. Paris 1, 669, 1743.

De Garmo: Abdominal hernia, 1910.

De Guise: Ann. Soc. de Chir. Paris. Ire serie, T9, 529, Juin 1859.

De Mayo, A.: Hernie par Glissemont. These Paris, 1897.

De Rooy, H. J.: Thesis, Lugduno-Batava, 1823.

Eggenberger, H.: Deut. Ztschr. f. Chir. Leip. 84, 524, 1908.

Fordeau, J.: Gen. de Med. Chir. et Pharm. Paris, 18, 268, 1803, and Sedillots Jour. de Med. Vol. 23, 1812.

Fallopius: Oper. omn., Tom. 2, Tractat. 9, cap. 34, 1600.

Follin and Duplay: Pathol. Externe 7, 379, 1883.

Gabryszewski, A.: Deut. Zeit. & Chir. 48, 1898.

Gage & Fish: Am. Jour. Anat., Sept. 1924.

Gascoyen: Tr. Path. Soc. London, 15, Dec. 1865.

Gerdes: Deut. Med. Woch. Leip. 21, 83, 1895—Quoted by Watson.

Gladstone, R. G.: Annals Surg. 34, 796-807, 1901.

Gray, H. M.: Pathol. Trans. Lond. 95, 1872.

Gunz, J. G.: Lipsiae, J. C. Langenhemium, 1774. (Watson). Also observationum anatomico-chirurgicarum de hernies libellus.

Gooch, B.: Surgery, vol. 2, London, 1767.

Hale, Kelly: Annals Surgery, 278, 1919.

Hardie: Med. Chron. Manchester 9, 105, 1888.

Hinman and Gibson: Arch. Surg., Jan. 1924.

Hitchinson, J.: Brit. Med. Jour. London, 2, 71, 1889 (by Watson).

Hutchinson, J.: Trans. Path. Soc. London 37, 451, 1886.

Jobert, L.: Mem. Soc. Biol. Paris ire serie., 2, 78, 1850. Gazette Med. de Paris, 1850.

Kaufman: Ueber plotzliches Auftreten und EinKlemmung von Fettbruchen. Diss. Frieburg, 1904.

Kimball: Bost. Med. and Surg. Jour. Date ?

Klinkosch: Dissert. Med. 40 Pragae et Dresdene 1, 179, 1775.

Kocher, A.: Deut. Chir. 183, 1887.

Kocher, Th.: Deut. Chir. von Billroth und Lucke, Lief. 50 b. Stuttgart, 1887, also Hand. der Allg. und Spec. Chir. von Pitha u. Billroth. Stuttgart, Bd. 3 Abth. 2. B., 1874.

Langenbeck, C. L.: Biblioth. fur Chir. 5. 3, St. 1. 648, 1813?

Latta, John S.: Dept. Anatomy, Uni. Nebr. Personal Communication.

Lejars, F.: Assn. franc. dc Chir. Paris, 18, 357, 1905 (Watson).

La Chausse: Haller. Disput. Chir. Selectae, Lausanne Bousquet, 3, 775, 1755.

La Chausse: De Hernie Ventrali, 1746 (by Watson).

Leveille: 1812 (Watson).

Lewisohn, Richard: Surg. Gyn. Obs. 32, 546, 1921.

Littre: Acad. de sc. Tl., 1704, and These de l'acad. des sciences, 1714.

Maunder, C. J.: London Hosp. Reports 1, 121, 1864.

Macready, J. F. C. H.: Treatise on Ruptures, 1893.

Maydl: Unterliebsbruche S. 194, 1896.

Minet-Alfred, Jules-Paul: Sur les Tumeurs Solides des Tuniques du Scrotum, These, Lille. Series 4e, 1896.

Minet, A. J. P.: These, Lille 4e Serie, 1896.

Meckel: Handbuch Path. anat. Vol. 2, 1818.

Morgagni: De sed. et Caus. Morb. and Epistle 43, a. 10, u. and Epistle 50, 24, 1740.

Morgagni: De sed et Caus. Morb., 1761 (Translated by Benjamin Alexander).

Moschowitz: Surg. Gyn. Obs., Apr. 1914.

Morgan, J.: Dublin Med. Press and Circular Vol. 4, 1867.

Monod et Terrillon: Traite Des Maladies du Testicule et de Ses Annexes, Paris 1889.
Orr, J. A.: Dublin Med. Press 17, 1847.
Pare, Ambroise: Ouevres, C. 15, 196, 1564.
Park: Ann. Surg., 1886. Phila. Med. Times, May 15, 1886.
Pellatan: Clin. Chir. T. 3, 1780.
Paget: Surg. Path. 451, 1876.
Petichius: Sylog. Anat. Obs. 89 Quoted by Morgagni.
Petit: Oeuvres Posthumes, Tom. 2. 215, 1815.
Petsche, Johan Zacharias: Sylloge Aanatomicarum Selectarum Observationem, 28 pp. Small 4 Halae. Mag. deb, Sept. 1736.
Poynter, C. W. M.: Personal Communication Prof. Anatomy, Uni. Nebr.
Quain, E. P.: Jour. Minn. State Med. Assoc. 30, 287, 1910.
Ransohoff, Joseph: Lancet Clinic, 1913.
Richter, A. G.: Comment. Gotting. Tom. 15, 33. Obs. 3, p. 35; Obs. 4, 1796.
Roeder, C. A.: Lipoma of tunica vaginalis testes (To be reported).
Sachs, W.: Munch. Med. Woch., Oct. 1908.
Schmidt: Unterliebsbruche S. 194, 1896.
Sausoy, Amdr.: Abhandlung uber die Radkialkur des Wasserbruches durch das aezmittel: Translated from the French, Leipzig, 131, 1792.
Scarpa: Hernia Linea Alba. Sull' Ernie, 1809.
Scarpa: Traite Pratique des Herniae, 1812. Translation by Wishart Edinburgh, 1814.
Schulzius: Act. N. C. Tom. I Obf. 225 Quoted by Morgagni.
Sandifort, E.: Gencesk. Biblioth. Decl. 6, p. 67, 1780?
Sebileau and Descomps: Malad. des organes Geenitaus de l'Homme Paris, 1916.
Tartra: Jour. de Med. Chir. et Pharm., 1805.
Tenain: Ann. de le Chir. franc., 1842.
Tillaus: Anat. Topogr. 705, 1875. Traite de chir. clin. S. 94, 1889.
Turner, W. Y.: Brit. Med. Jour. London, 2, 389, 1917 (by Watson).
Verdier: Jaboulay, M. et Patel. M.; 400 (Watson) 1908.
Watson, F. F.: Hernia, 1924. (Most complete of all Bibliographies.)
Wernher, A.: Von den Fettbruchen und den Bruchahnlichen Fettqeschwulsten, Arch. f. Path. Anat. 47, 178, 1869.
Wernher: Virchows Arch., July-August 1869.

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UNILATERAL FUSED KIDNEY*

Report of a Case

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St. Paul, Minnesota

Unilateral fusion is the union of both kidneys on one side of the body. It is an anomaly of form of the kidney and is result of fusion of the lower pole of the higher lying kidney with the upper pole of the lower organ. Both kidneys usually come to lie on the side of the body occupied by the upper organ. However, Dickenson, 1895, and Kidd, 1910, each reported a case in which the upper organ was the ectopic one. In either case, the ureter of the malposed kidney crosses midline to enter the bladder normally.

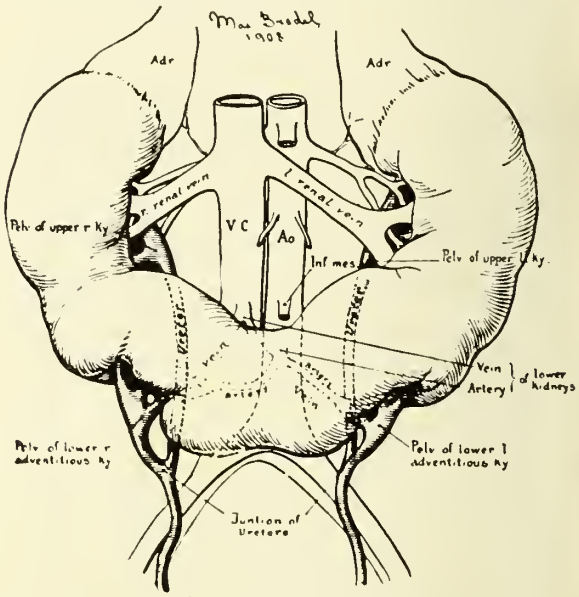


Fig. 1. (Kelly-Burnham)

Unilateral fused kidney is the rarest of all renal anomalies. A survey of the literature would indicate that diagnosis of this condition in the living subject has been accomplished by combined cystoscopy and pyelography but twelve times. Steward and Lodge found but one case in 6500 autopsies, and Morris, one in 15,908 post mortem examinations. A small number have been discovered during operations conducted upon the kidney, while others have been encountered in the course of surgical procedures on abdominal viscera.

Fusion of the kidney occurs during early embryonic life. On each side of the body a ureteral

*Presented before the Twin City Urologic Society, St. Paul, Minn., September, 1925.

bud develops from the Wolffian duct and together with its metanephric blastema begins to ascend out of the pelvis toward its future position in the renal fossa. It is during ascent that fusion probably occurs by a union of the metanephric substance of one kidney with that of its fellow on the opposite side of the body. If fusion takes place between the lower poles, or between the upper poles, horse-shoe kidney results (Fig. 1). When the growth of the renal bud is more rapid on one side of the body, union results in a fusion of the lower pole of the higher lying kidney with the upper pole of the lower (Fig. 2).

The clinical picture may offer no suggestion that an anomalous condition exists. A palpable

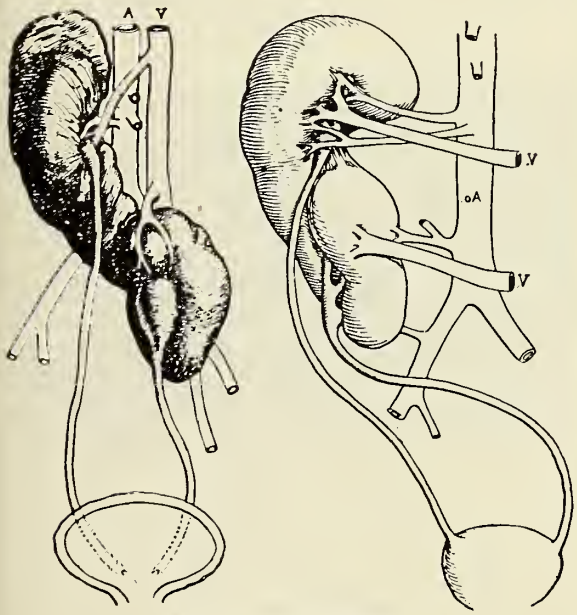


Fig. 2. (Kelly-Burnham)

abdominal tumor is present and vague discomfort in the abdomen is complained of. If calculus exists in the ectopic kidney the radiogram will generally show a shadow situated well toward the mid line in the lower abdomen. Enlargement of the mass accompanied by increased pain would indicate the presence of hydronephrosis. Urinary symptoms are usually absent.

CASE REPORT

A Russian male, only slightly able to understand or converse in English, thirty-nine years of age, consulted the medical department of the Wilder Dispensary because of tumor in his abdomen. He first noticed the mass seven years ago, and believed it was becoming larger. He also complained of vague abdominal pains occasionally accompanied by nausea.

On physical examination a mass about the size of an orange could be palpated just to the left and slightly below the umbilicus. It was smooth, firm, and only slightly movable. A linear scar corresponding to a left rectus incision was visible on the upper abdomen. It was gathered that he had been operated on because of



Fig. 3.

this mass seven years ago. Fluoroscopic examination of the gastro-intestinal tract revealed a normal stomach, duodenum, and colon. The report stated that the abdominal mass was apparently near the lower border of the stomach but was not connected with it. The case was referred to the Genito-Urinary Clinic. Cystoscopy and pyelography were performed in an effort to establish the nature of the mass.

Cystoscopy:—July 14, 1925. Bladder urine clear and negative to microscopic examination. Bladder mucosa normal throughout. A few small polypi were seen in the prostatic urethra to either side of the verumontanum. Ureteral orifices were symmetrically situated and emitted good jets of clear urine. A number 6 F ureteral catheter was passed full length on each side and specimens were collected. Sodium Iodide, 15 per cent, was injected into left kidney pelvis and along left ureter while slowly withdrawing the catheter.

Laboratory Examination:—Right ureteral specimen: 6 pus per high power field centrifuged. Left ureteral specimen: 4 pus per high power field centrifuged.

Interpretation of Pyelogram:—The left kidney was poorly rotated with the ureter entering anteriorly and

the calyces directed posteriorly. The lower end of the kidney was level with the third lumbar vertebra (Fig. 3). A lead catheter in the right ureter crossed mid-line until its tip lay slightly to the left of articulation of the third and fourth lumbar vertebrae: It was then apparent that one of the fusion anomalies of the kidney was present.

Cystoscopy:—July 21, 1925. A second cystoscopy was



Fig. 4.

performed and the pelvis and ureter of the right kidney injected after wedging a catheter with a number 15 F wax bulb into the lower ureter. Injection with Sodium Iodide, 15 per cent, was carried out and a good outline of the entire ureter as well as of the pelvis obtained.

Interpretation of Pyelogram:—A small kidney pelvis was situated to the left of mid-line lying transversely with the larger of the two major calyces to the left of the fourth lumbar vertebra. A small major calyx with a long narrow infundibulum was situated toward the right over the body of the fourth lumbar vertebra. The ureter joined the pelvis inferiorly and passed down across mid-line to enter the bladder in a normal position (Fig. 4).

Fusion had occurred between the lower pole of the left kidney and the upper pole of the right. Because of this fusion the left kidney was poorly rotated while the right lay transversely with the greater part of its substance to the left of the mid-line, connected by a narrow strip to a smaller prevertebral portion (Fig. 5).

Both kidneys were the seat of mild pyelonephritis, as made evident by the finding of pus cells in the specimens. No other pathology could be demonstrated. The patient was given instructions to combat the infection, and discharged.

When the nature of an abdominal mass cannot be determined by the ordinary means, complete urologic investigation should be carried out. Abnormalities of the kidney will be found to account for many of these masses. Accurate diag-

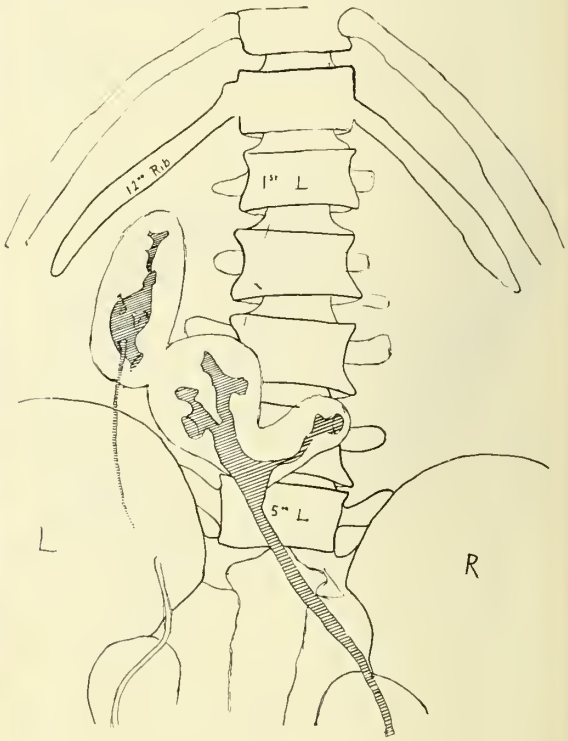


Fig. 5.

nosis of co-existing renal disease can be made and proper treatment instituted.

REFERENCES

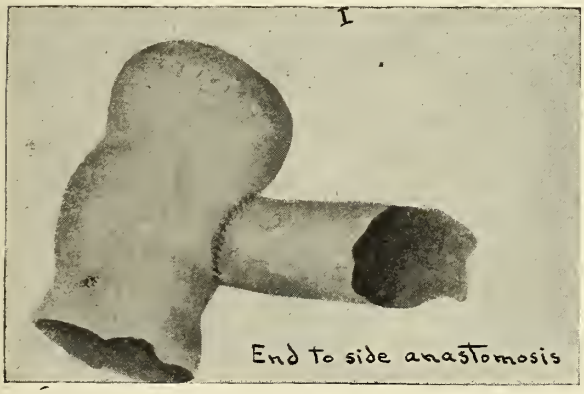
1. Stewart & Lodge: Unilateral fused kidney and allied renal malformation, Brit. Jour. Surgery 2:27 (July) 1923.
2. Dourmashkin, R.: Unilateral fused kidney, Report of a case. Jour. Am. Med. Assn. 82:25 (June) 1924.
3. Squier, J. Bentley: Anomalies of the kidney. Cubot's Modern Urology, 425-426.
4. Sexton, W. G.: Resection of unilateral fused kidney, with case report. Jour. Urol. 13:4 (April) 1925.

DIAGONAL END-TO-SIDE INTESTINAL ANASTOMOSIS*

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Since the days of Roger of Palermo who in about 1180, seems to have made the first record of intestinal suture, there have occurred many advances in surgery of the gastro-intestinal tract. According to Garrison, the text book written by Roger was the standard at Salerno, where he (Roger) had been a student and a teacher. In this text he introduced suture of the intestines over a hollow tube.

There have been many additions and refinements introduced since from time to time, but we are perhaps more familiar with those of a later day described and practiced by Theodor Billroth,

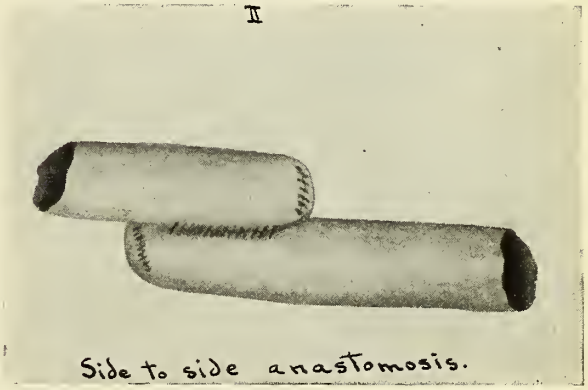


Mikulicz, Keen, Senn and Murphy. The work of these immortals is being carried forward today by the Mayos and many of their contemporaries so that gastro-intestinal surgery with the aid of advancing knowledge of physiology and chemistry is approaching more nearly the goal of therapeutic accuracy.

For some years the method of intestinal anastomosis, after resection of the intestinal segment, has been either that of side to side (Fig. 2) or of end-to-side (Fig. 1) anastomosis. I refer particularly to those instances where the small gut is joined to the colon. The end-to-end anastomosis seldom is applied here.

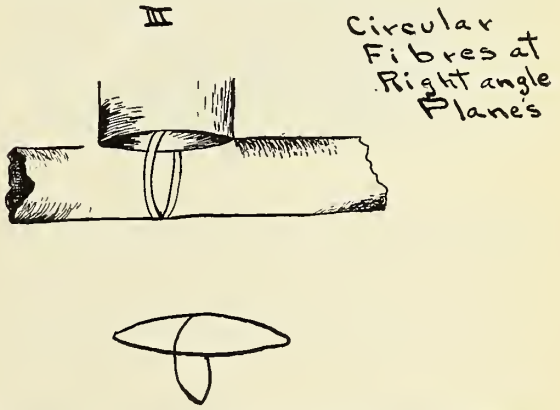
The end-to-side anastomosis is unanatomical (Fig. 3). If we stop to consider for a moment the histologic anatomy of the musculature of the intestinal walls we find that we are approximating the circular fibres of the small gut at right angles to those of the large gut. The tendency, therefore, is toward stenosis at the point of anastomosis.

The side-to-side anastomosis, which is perhaps more commonly used, also has its disadvantages



(Fig. 2). The current passing through the lumen of such an anastomosis must be deflected twice in its course and each time approximately at right angles. The tendency, therefore, during peristalsis is toward an impact against the blunt end or stump and a dilatation of the gut at this point (Fig. 4). This gives the clinical symptom of pain, tenderness and local stasis.

Some years ago I had occasion to resect part of the colon and to do a side-to-side anastomosis-ileum to the side of the colon. The patient was comfortable for a few months after which the symptoms I have mentioned developed and the

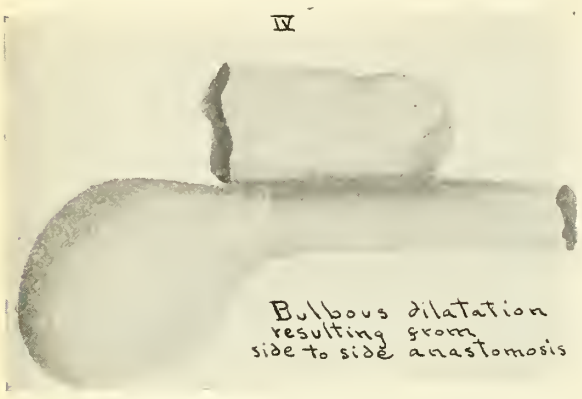


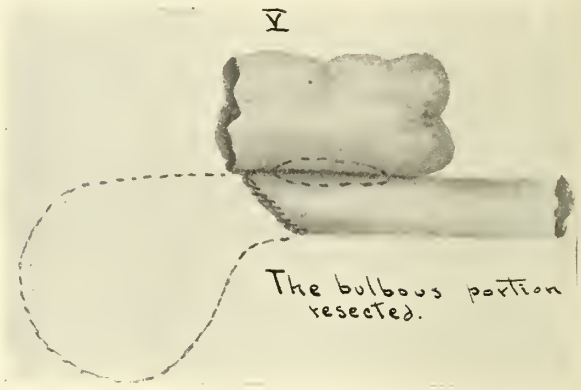
barium x-ray showed a ballooning at the resected end of the small gut at or just beyond the point of anastomosis. On reoperation (Fig. 5), the distended stump was found and resected and the

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 18, 1926.

operation was followed by relief of the symptoms.

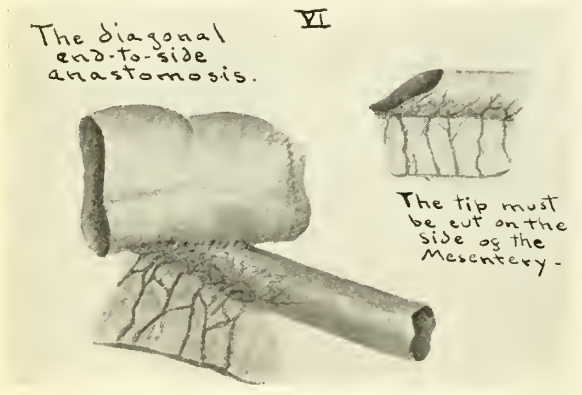
This experience suggested a course which would eliminate the possibility of such a malfunction and which would at the same time give





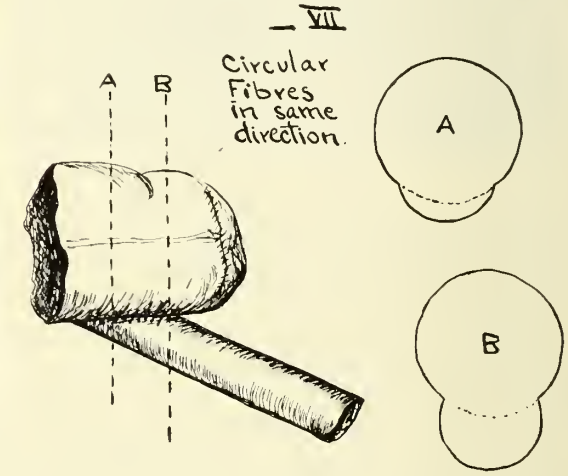
a larger stoma than the one which results from end-to-side anastomosis. Moreover the element of postoperative stenosis at the point of the junction could be eliminated.

This simple procedure consists of cutting the small gut diagonally (Fig. 6), swinging the enterostomy clamp higher on the side opposite the



mesentery in order that the mesentery will amply nourish the tip of the resected intestine. This gives a larger opening in the small gut for approximation to one of the same size in the large gut. It throws the current in the lumen of the small gut directly into the lumen of the large gut and eliminates the two right angles, which are present in the side-to-side anastomosis. One or two stay sutures are placed in the acute angle to fasten the two viscera securely and to prevent tension at this point of the anastomosis. The anatomic approximation of the musculature is thus more accurate. The circular fibres of the two viscera are in this manner more or less continuous (Fig. 7) instead of at right angles to each other, and any possible bulging or dilatation of a stump is impossible.

This procedure, done on the experimental ani-



mal, has worked perfectly and the specimen removed after a period of several weeks showed the lumen functioning almost in a straight line and with no dilatation whatever.

PERICARDITIS*

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Of all the cardiopathies, few escape detection more easily than does pericarditis, particularly in its earlier stages. The quite obvious reason for this rests in the so frequent absence of subjective symptoms, or their being masked by the more conspicuous symptoms of concomitant disease. First recognized in the cadaver in the Eighteenth century as a hydrops of the pericardium, pericarditis was thought to be always characterized by the presence of fluid. With this conception in mind, Senac during the middle of the Eighteenth century described the symptoms of the disease as being pain and pressure in the anterior part of the chest. Some time later, Auenbrugger added precordial bulging and increase in the area of cardiac dullness to the list of manifestations brought on by pericarditis. Collin, in 1824 described "the sound of new leather" whose presence he considered diagnostic of pericarditis prior to the state of effusion. His discovery, however, was given little note and even less credence until the year 1836 when Bouillaud stressed the value of friction sounds and particularly the new leather sound as being important in the diagnosis of pericarditis.

Sibson[1] very rightly made the following statement, "Inflammation of the surface of the heart and the lining of the pericardial sac occurs so very rarely by itself that we cannot practically regard it as a distinct disease." While it is possible for a primary idiopathic pericarditis to exist, the frequency of this diagnosis continues to become less and less with more careful examination for obscure focal infections such as infected teeth, pyorrhea, infected tonsils, chronic gallbladder disease, tracheo-bronchial lymphadenitis or even a pulmonary infection without clinical manifestations.

Secondary pericarditis, either hematogenic or as result of contiguity is more frequent. In this group, rheumatism, pneumonia, general sepsis, pleurisy, empyema, tuberculosis, nephritis, diabetes, carcinoma, typhoid fever and diphtheria rank as paramount among the primary diseases to which a concomitant or subsequent pericarditis with or without effusion may be secondary.

Because of the broad extent of the field of discussion and the time limitations of this paper, two phases, only, of pericarditis will be considered: (1) traumatic pericarditis and (2) adherent pericardium. The former is selected because of its infrequency; the latter because of its frequency.

TRAUMATIC PERICARDITIS

Traumatic pericarditis owing to its infrequency receives but little mention in the literature. Many authors fail to mention it at all. Tice[2] alludes to the possibility of its existence in a single sentence. Vaquez[3] in his recent new work disposes of the subject in fifty words. "Traumatic pericarditis, which was described long ago in France as well as abroad, ordinarily assumes the dry form. Its existence has been proved by necropsy on many occasions. Its symptomatology lacks clearness and presents nothing special. It may recover or be the point of departure of adherent pericardium."

From this brief description it may be readily inferred that the condition is more or less of a clinical curiosity. One such case was seen in our clinic during the past year.

A. M., male, white, aged 27, was admitted to the hospital in a state of unconsciousness following an automobile accident in which he had been thrown violently forward and against the steering wheel of the car which he was driving. Examination on admission showed no abnormal findings other than a beginning discoloration of the right eye, excoriation of the nose and a bruise of the left leg. Temperature 98.2°. Pulse rate 76 per minute. Respirations 20 per minute. Leucocyte count 9000. On regaining consciousness he complained of pain in the upper abdomen and the left chest, cough and chills. Thoracic pain was aggravated by deep inspiration. He felt most comfortable in the semi sitting position. He stated that he had felt perfectly well up to the time of his accident.

On the following day the temperature was elevated to 101°, the pulse to 110, and the respirations to 35 per minute. There was present at this time a definite friction rub along the left border of the sternum. Three days after admission, there were present definite signs of left pleural and pericardial effusion and coarse rales throughout the right lung. X-ray studies at this time and subsequently showed massive left pleural effusion with slight cardiac displacement to the right and a large pericardial effusion. Hiccoughs became a persistent and distressing symptom. During the ensuing three weeks the temperature, pulse and respirations remained higher than normal. By the end of the fourth week all symptoms had subsided. The effusions were all re-

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sorbed and the patient was allowed to return home feeling quite well. He has subsequently been in good health and is doing his former work as chauffeur.

ADHERENT PERICARDIUM

Adherent pericardium, the all important sequela of pericarditis, presents such a variety of subjective and objective symptomatology that no single symptom complex can be considered as representative. By far the greater number of cases of this condition are secondary to a previous pericardial disease, especially pericarditis. Rheumatism, Bright's disease, tuberculosis and pleuro-pneumonia, by reason of their prominence as etiological factors in the production of this latter disease, thus also are of primary importance in the etiology of adherent pericardium. In some instances adherent pericarditis is secondary to mediastinal disease such as mediastinitis, aneurysm or malignancy. The preponderance of cases occurs between the ages of ten and thirty years.

From the standpoint of subjective complaints, adherent pericardium may be divided quite naturally into three groups as described by Frederick Tice[2].

The first is the silent group representing nearly all cases in which the adhesions are entirely intrapericardial; that is to say adhesions exist between the layers of the pericardium but not to surrounding structures. Such a condition is relatively benign and usually remains unrecognized during life; for while these adhesions may limit the lubrication of the heart, rarely, if ever, do they embarrass the functional efficiency of that organ.

The commoner manifestations of extrapericardial adhesive pericarditis are those of chronic heart disease. Dyspnea, cough, palpitation and minor states of cardiac failures are the most frequent. At times precordial pain or discomfort are complained of, probably due to a subacute inflammatory process in the pericardial sac, the pleura or the mediastinum. Painful attacks, almost anginal in character, are said to occur. At times, also, the outstanding complaints will be those of digestive disorders attendant upon cardiac insufficiency and passive congestion of the liver.

Pick's syndrome comprises the third group, which in addition to the manifestations of chronic heart disease are to be found recurrent ascites, but no edema of the legs, and the enlarged, firm liver of pericardial pseudocirrhosis causing a feeling of abdominal fullness.

Since there is such an inconsistency in subjective symptoms, the diagnosis of pericarditis must rest upon physical signs. When there are only intrapericardial adhesions present there are usually no physical signs. The following summary of important signs concerns itself only with those cases in which extrapericardial adhesions are present.

Systolic retraction, confined either to the apex or seen as high as the third space, is of importance. It is always pathological if it persists in all positions of the patient, especially in the left lateral decubitus.

Permanent retraction of the precordium when not explained by rickets, pleural adhesions, etc., is strongly suggestive of adherent pericardium.

Broadbent's sign when present is of great significance. It is not however pathognomonic, for Vaquez[3] reports this sign present in large cardiac dilatation and posterior pleural adhesions.

Wenckebach's sign, a crossed respiratory profile, is rare.

Palpation may disclose a diastolic rebound at the apex. If present it is probably always pathognomonic.

Percussion usually discloses an enlarged area of cardiac dullness, due to associated cardiac change. Of far greater importance is the absence of respiratory excursion along the borders of the area of heart dullness. The borders, being fixed, do not move with respiration or change of position.

Auscultatory findings are usually confined to those of associated endocarditis or myocarditis.

The pulsus paradoxus of Kussmaul, when unexplained by other conditions such as massive pleural effusions, speaks strongly for adherent pericardium.

Kussmaul's sign, an inspiratory swelling of the jugular veins at the height of inspiration though infrequent, is very valuable. Friedreich's sign, a diastolic collapse of the cervical veins, is also most valuable.

Fluoroscopy furnishes extremely valuable data and should be performed wherever possible. Roentgenographic plates are of less value unless multiple exposures are made with the patient in different positions. In routine fluoroscopic examination for evidence of adherent pericardium,

in addition to revealing the condition of the lungs and pleura and the general appearance, size and contour of the heart, should especially stress the mobility of the apex in different positions of the body and in various phases of respiration. A fixation of the apex shadow and absence of its lateral displacement presumes adhesions.

To establish the diagnosis of adherent pericardium, no single sign is adequate. Rather does it require a complete symptom complex. Failure to establish the diagnosis rests not so much upon misinterpretation of signs as upon errors of omission in the history or the physical examination.

Differential diagnosis concerns itself chiefly with the endocardial, valvular and myocardial states.

As to prognosis, the outlook in any individual case is determined by the extent of adhesions either already present or in the process of formation. The intrapericardial type of adhesions do not influence the prognosis. In the presence of extrapericardial adhesions, prognosis is determined by the functional efficiency of the heart to withstand the mechanical obstructions presented. The ultimate prognosis is of course bad.

The entire pharmacopeia contains no drugs that meet the therapeutic indications, which are to prevent the formation of further adhesions and combat the effects of those already established. A carefully regulated schedule of exercise combined with a proper, easily digested diet and good elimination are of great importance. Systematic graduated exercise may suffice to develop and maintain an adequate compensatory cardiac hypertrophy.

In the presence of a failing myocardium, of course, the usual routine for decompensation must be strictly observed.

Since adhesive pericarditis produces death through mechanical interference with the heart, surgery has attempted to meet the therapeutic indications which medicine cannot fulfill. Cardiolysis, Brauer's operation, is the one of choice. It has as its object the freeing of one or more of the fixed points of the heart, thus permitting greater freedom of motion to that organ. The operation is indicated when there is severe and increasing cardiac embarrassment but with the functional cardiac integrity still retained. One such operation has been successfully performed in our clinic.

CASE REPORT

The patient, M. P., a white female, aged 17, was first admitted to the hospital for a pneumonia and subsequent pericarditis. She was discharged from hospital about five weeks later feeling well. Three months from date of discharge she was readmitted complaining of cough, dyspnea, orthopnea, weakness, loss of weight, tachycardia and palpitation, occasional nausea and feeling of fullness in the abdomen. Present complaints were of about two months duration and had at first been mild but were becoming progressively worse. She was found to be in a state of marked cardiac embarrassment with a large pleural effusion on the left, cough, fever, ascites and liver enlarged about four fingers breadth below the costal margin. A diagnosis of adherent pericardium and pericardial pseudocirrhosis of the liver was made. The patient failed to respond to the usual treatment for a failing myocardium including frequent thoracentesis, so that after three weeks cardiolysis was decided upon and the Brauer operation performed under general anesthesia. After some two and one half months of convalescence the patient was sent home feeling much improved. When seen one year later she had gained twenty five pounds in weight, was feeling well, and was able to work daily at home. The liver edge had receded to its normal level. There was no fluid demonstrable in the chest or abdomen. Pulse of good quality and rhythm; rate 76 per minute. She subsequently developed a left apical pulmonary tuberculosis but is still alive, almost five years having intervened since operation. There had been no recurrence of her former symptoms.

BIBLIOGRAPHY

1. Sibson: Pericarditis. Reynolds System of Medicine, London 1877.
2. Tice: Diseases of the Pericardium. Tice's Practice of Medicine VI, 205.
3. Vaquez-Laidlaw: Diseases of the heart, W. B. Saunders Co. 1924.

VITAMIN B AND "VITALITY"

During the excessive enthusiasm a few years ago for the then newly discovered vitamins and the exalted hope of great physiologic accomplishment through their administration in a therapeutic or prophylactic way, these food factors—notably the vitamin B of yeast—were often expected to "pep up" the jaded person. Somehow it was assumed that the vitamin must "stimulate" one function or another. The actual investigations have, however, been disappointing in some ways. Secretion has not as yet been discovered to be stimulated or "pepped up" in any way. It has been demonstrated that deprivation of vitamin B does not of itself lower the basal metabolism, nor is the latter altered by large doses of vitamin-bearing products. So far as the basal heat production is a measure of "vitality," it has been shown that the ingestion of amounts of vitamin B in large excess over the minimum requirements for growth and continued well being does not benefit an animal.

AMNESIA, A CLINICAL STUDY*

Report of Eight Cases

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The study of cases of amnesia is a most interesting one. Since the World War this condition apparently has increased, not only in frequency but also in popularity, both in the medical journals and in the daily press. The undue publicity given these cases undoubtedly has produced a small number of amnesic malingerers who attempt to hide behind some obscure pathologic process or to seek protection under the comforting wing of some dramatic neurological disorder. The majority of cases, however, have a definite disturbance in their memory sphere based either on a functional or an organic foundation.

Memory consists in the conservation and storing up of impressions or experiences and in their later reproduction. These are the physiological elements. In addition to them are the psychological elements, important but not essential, namely, recognition and localization in the past. These memory impressions are stored up in the cerebrum, either somewhere in the frontal lobes or in a diffuse manner throughout the brain cells and correlated by way of the association fibers.

An impairment in the functions of the brain, either due to injury, disease, or psychic turmoil, frequently produces a destruction or a dissociation of memory. Circumscribed memory gaps are designated as amnesias; the circumscription may be confined to content or to time. The more recent memory groups are more readily involved in amnesia than those which are more highly organized because they are less firmly fixed and have had less opportunity for repeated impressions. The amnesia frequently involves a period prior to the injury or disease and is then spoken of as retrograde amnesia. This form often manifests itself after cerebral concussion, due to head trauma, or after marked cerebral congestion or anemia, such as occurs in attempts at hanging. Anterograde amnesia occurs much less frequently. It usually presents itself in cases where there is a gradual transition to lucidity and where the mental confusion is more pronounced than appears on the surface. This period of amnesia may exist for hours, days, or even months. In one of our cases it continued for at least three months, during which time the patient appeared normal in every way except for an occasional brief attack of confusion, associated with terrifying hallucinations.

Prolonged intoxication of the central nervous system, particularly due to alcohol, occasionally produces a mental disorder known as Korsakoff's psychosis in which amnesia is a characteristic symptom. These patients have complete loss of memory for recent events and fabricate delusions to fill in this memory gap. Associated with this they frequently suffer from multiple neuritis, with a resultant paralysis of the extremities. This characteristic picture of a Korsakoff's psychosis has been modified somewhat since the Volstead Act became effective and since the introduction of more highly toxic alcoholic beverages, such as moonshine. The amnesia is usually more prolonged and more complete. Hallucinations of sight frequently are so pronounced that the extent of the amnesia is not appreciated until the patient has practically recovered. The multiple neuritis manifests itself more in the sensory than the motor sphere, and these patients complain bitterly of excruciating pains and hyperesthesias in the extremities, while the motor control is quite normal.

Similar to alcohol, the acute as well as the chronic poisoning with carbon monoxide occasionally is followed by a period of amnesia, usually of the retrograde type. This, along with the other symptoms, is due to the characteristic pathologic changes which occur in the brain. Areas of cerebral softening secondary to emboli of or punctate hemorrhages from the cerebral blood vessels usually in relation to the lenticular nuclei are the most constant lesions.

Cases of uremia and of puerperal eclampsia may also manifest periods of retrograde amnesia during the course of their illness. This is due either to the convulsive seizures similar to what occur in epilepsy, to the general toxemia, or to the associated cerebral edema. Heilbrönner[1] reports a case of puerperal eclampsia in which the outstanding symptom was a marked amnesia, almost of the dual personality type, along with other indefinite psychotic manifestations.

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Another interesting group of amnesia cases are the epileptics. The majority of these patients present some disturbance in the memory sphere. Hand in hand with the mental deterioration which occurs so frequently in the epileptic patient, definite evidences of memory impairment manifest themselves in the daily routine of life. A true amnesia, both retrograde and anterograde in type, occurs occasionally with an epileptic seizure. The more unusual group, however, are those cases in whom the epileptic equivalent manifests itself in prolonged periods of amnesia or in twilight states. In this condition the patient may appear normal during the entire attack, wander away, and so forth, and suddenly regain consciousness without any recollection of what has transpired during the amnesic period.

Heilbrönner[1], and others, believe that these twilight and dual personality states, even when they occur in an epileptic, should be attributed to hysteria. In the hysterical amnesias the essential factor frequently is the exclusion of an unpleasant recollection or experience from the realm of consciousness. The individual, so to speak, hypnotizes himself and thus seeks refuge and comfort in the dissociation of his consciousness. He literally runs away from himself and from an intolerable problem which has become unbearable. Case 8 beautifully illustrates this in his several attacks of amnesia, which were always preceded by a disgraceful, distasteful, or discouraging situation which the patient felt unable or unwilling to cope with.

Attacks of amnesia, usually of short duration, may occur in psychopathic or insane patients during the course of a marked psychic upset. Furthermore, it is frequently impossible to later on recall the events during a severe temper spell. Similarly, individuals in a highly upset emotional state, such as caused by a serious accident, without physical injury to the patient, or during the commitment of a crime or murder, often, and truthfully, are unable to give an account of what occurred during that period.

Bleuler[2] states that in all these conditions that lead to amnesia we regularly have a markedly changed mental activity. In the hysterical states, and in attacks of rage and anxiety, it is the emotional effect that produces a different relation; in alcoholic intoxication and in epileptics it is the poisoning of the brain; while in organic cases it is, doubtless, chiefly a metabolic disturbance in consequence of circulatory changes, particularly through the vascular occlusions and cerebral pressure.

Coriat[3] groups his amnesias according to the extent of restoration of the amnesic period to the conscious self. This restoration is accomplished by what is known as tapping the subconscious, as in hypnosis, in states of abstraction, in crystal gazing, or automatic writing. Mental synthesis is the term designated when these split-off experiences are made whole again. His three groups are as follows:

1. Amnesic states in which the dissociation was of such a nature that a complete experimental synthesis of the lost experiences was possible. This group comprises short hysterical, epileptic, and alcoholic amnesias, wandering states, and certain types of amnesia following cerebral embolism.

2. Retrograde amnesia following blows to the head in which the whole or a portion of the amnesic period spontaneously cleared up.

3. Amnesic states in which the memories were so completely destroyed or dissociated that neither spontaneous restoration occurred or experimental synthesis was possible. In this group may be placed protracted epileptic amnesias and the retrograde amnesias of cerebral concussion not comprised under Group 2.

Cases of amnesia in whom the memory lapses can be restored to the conscious self by means of hypnosis or autosuggestion are usually considered of an hysterical type. However, similar results have been obtained in organic disorders. Shilder[4] reports a case of amnesia secondary to attempted suicide by hanging. By means of hypnosis memory for the amnesic period was completely restored.

The following eight cases are illustrative:

Case 1.—Cerebral concussion with retrograde amnesia of two hours' duration.

A woman, aged 25, was admitted to the Neurological Service at the Ancker Hospital with a history that her automobile had collided with another car and she had been hurled to the pavement and rendered unconscious. The neurological examination was negative throughout except that the patient was unconscious, pulse 85, blood pressure, systolic 130, and diastolic 70. She regained consciousness after four hours, felt well except for a severe headache, and was able to leave the hospital the following day. She remembered taking her car out of the garage in Minneapolis, but had no recollection of

driving through that city, calling at a friend's home, and driving through St. Paul, a period of about two hours prior to the accident.

Case 2—Severe cerebral concussion with hemorrhage, retrograde amnesia of ten days' and anterograde amnesia of about three weeks' duration.

A man, aged 48, construction foreman, with a negative family and personal history was referred by Dr. A. Conley, Cannon Falls, Minnesota, July 29, 1924. His wife stated that on July 19, 1924, about 8:30 p. m., while her husband was riding horseback, a Buick roadster ran into the horse with such force that the horse was thrown over the auto and the patient hurled to the ground. He was rendered unconscious and remained so for about eighteen hours. He then regained consciousness and had short rational periods. His condition gradually improved and he seemed clearer mentally. On July 27th he complained of diplopia.

During the first four days following the accident his pulse varied between 48 and 72. He was transferred to Mounds Park Hospital July 29th, where I first saw him. He was confused, disoriented as to time and place, and thought this was 1907 or 1913. He could not recall where he lived or what town he came from. He complained of double vision and severe headache.

The neurological examination was negative throughout except that he had a positive Romberg to the right and swayed to the right when attemptng to walk. His pulse was 63, blood pressure, systolic 128, diastolic 75. On August 2d his pulse was 46, a spinal drainage was done, and 40 c. c. of spinal fluid were removed. The fluid was under increased pressure, definitely yellowish, contained a trace of globulin, 80 cells, a negative Wassermann, and a negative colloidal gold curve.

Following the lumbar puncture his head felt clearer and he appeared brighter mentally. Spinal drainage was repeated on August 4th. His mental symptoms were suggestive of a Korsakoff's psychosis. His memory for recent events was impaired and if questioned about the past day or so he would tell about working with his crew, about visiting some neighboring town, about some auto ride he had yesterday, and so forth. He had intervals during which he seemed rational in every way. This condition continued for about two weeks and by August 16th his mental picture had returned to normal. His headaches gradually subsided and by September 15th he was discharged from the hospital. He still complained of diplopia and a tendency at times to stagger to the right. He was seen by Dr. Wm. Lewis who reported that the diplopia was due to a paresis of the right superior rectus eye muscle, which, in a measure, explained his difficulty in walking. He had no recollection of anything since June 9th, ten days before his injury, remembered nothing about his accident, his trip to Mounds Park Hospital, or his stay at the hospital during the first seventeen days, although during a greater portion of this latter period he appeared quite normal.

Case 3—Mild cerebral concussion with headache for five days, followed by a period of amnesia, during which the patient wandered away and gradually regained consciousness seven days later.

A man, aged 37 years, a broker, was seen in consultation with Dr. Asa Johnson, St. Paul, February 25, 1926. His family history was negative except that his mother had paralysis agitans. His personal history shows that he had measles at 16 and again at 34; influenza at 31. He was overcome three times with gas from a charcoal burner in a closed freight car. This was not serious but it necessitated his being away from work twice, in February and in December, 1925. He was not unconscious but was very dizzy. He had frequent headaches while working in cars heated with charcoal burners. He denies the use of alcohol, and venereal disease.

On the morning of February 11th he slipped on the ice and fell on the cement sidewalk, striking his shoulder and the back of his head. He complained of severe headache and dizziness. For the next five days he felt miserable. His wife stated that he did not look well, nor did he act like himself. Part of the time he attended to his work. On the afternoon of February 14th he had to go to Minneapolis to inspect some cars. He remembers leaving Minneapolis and driving across the high bridge in St. Paul, but he has no recollection of which way he came, whether it was by the River Drive, University Avenue, or some other street.

On the evening of February 16th, about seven o'clock, he left home to go to his office. After arriving there he telephoned his wife about the furnace. This was the last that was heard of him until February 23d, when found in Peoria, Illinois. He fell over quite suddenly while in a cigar store, became unconscious, and was taken to a hospital. After an hour or so he aroused sufficiently to give his wife's name. The only address he remembered was St. Paul. His clothes and shoes were muddy, and he had not shaved. He had lost about 25 pounds in weight. His automobile was found at Red Wing, Minnesota, in which he had evidently driven from St. Paul.

When the family arrived at the hospital he was afraid to go home. He thought he would give the children measles and talked about it constantly. Three years prior he had given them measles on his return home. He was brought home and stood the trip well. He slept well during the night but had a short attack on the sleeper during which his breathing seemed shallow and his color turned ash-gray. He felt cold and clammy and was aroused with difficulty.

When he was first seen February 25th at 6 p. m. he appeared slightly confused and had no recollection of what had happened from the time he was in his office on February 16th in the evening until he awakened in the hospital February 23d. Since then he has had an occasional twitching of the thumb and first finger of his right hand. He complained of some frontal headache and pain over the bridge of his nose. He had blisters on his feet and seemed quite exhausted. He had a recent scar on his tongue. He stated that when he awakened in the hospital his tongue was sore and swollen. There was a small abrasion about the size

of a nickel on the top of his head. There were bruises on his legs.

The neurological examination was negative throughout. His pulse was 74; blood pressure, systolic 120, diastolic 70; urine normal. There was some tenderness over the bridge of the nose and the forehead. He seemed quite confused, had great difficulty in concentrating, could not remember names, and was unable to do the higher multiplication tables but could do the lower ones and simple addition with great effort. This gradually improved.

He slept fairly well that night. The next morning, February 26th, he got up about 8 a. m., put on his old trousers, his shoes without tying them, the jacket of his pajamas, walked down stairs, and insisted on going to the office. An hour later he had no recollection of this. He was quite well all day. He was given 1.5 grs. of luminal at bedtime. He slept all night and was quite drowsy and somewhat confused the next day. A lumbar puncture was done on the 27th and 25 c. c. of clear spinal fluid under pressure was removed. Following this his head felt clearer and the pain was better. The spinal fluid was clear, contained 2 cells, a negative globulin, a negative Wassermann, and a negative colloidal gold curve. On the morning of the 28th he was quite restless and worried about his business, which his wife said was quite normal.

He made a satisfactory recovery in time except that he has no recollection of anything that transpired between February 15th and February 23d. He evidently sustained a cerebral concussion, which five days later was followed by a period of confusion and amnesia.

Case 4—Excessive alcoholism for about ten months, followed by brief periods of confusion with terrifying hallucinations for about nine months, with a period of amnesia of nine months' duration, with complete recovery except for amnesic period.

A male, age 29 years, was seen in consultation with Dr. J. B. Brimhall, St. Paul, December 18, 1925. His family history was negative. His personal history was as follows: He had broncho-pneumonia at 20. While in the service at the Argonne Front with the American Expeditionary Forces he received a blow with a rifle butt on the occipital region of the skull, and sustained a slight cerebral concussion. In August, 1923, he prevented a crazed negro from attacking a friend with a butcher knife. After the excitement subsided the patient became hysterical, had a severe crying spell, was nauseated and very depressed for several hours, but recovered entirely after a good night's rest. He was a successful retail merchant in Spokane, Washington, from 1921 until the fall of 1924. About this time he began to drink, moderately at first, but to excess later on. This continued until July, 1925. About November, 1924, he complained of headaches, dizzy spells, and suffered from periods of nervousness, undue irritability, and depression. He became inconsiderate, unreasonable, and neglected his business. These symptoms gradually became more pronounced. In the spring of 1925 he would have an occasional fainting attack of short duration. His business judgment became very poor, and he lost approximately $22,000 during that spring and summer because of foolish business deals. In July, 1925, he had a severe attack as follows:

While driving an automobile he suddenly stopped his car, said he felt extremely nervous, twitched all over, especially on his left side, and became unconscious for about a minute. This was followed by nausea, pain in the head, and diplopia for a short period. These spells gradually increased in frequency and severity. In August, 1925, his attacks would average about three a day and were accompanied by severe occipital headaches, pain in his left side, and terrifying hallucinations of sight and hearing, such as German soldiers attacking him. He would fight desperately until he was completely exhausted. These attacks varied from one-four to one hour, and were followed by ptosis of the left eyelid and some ataxia of the left extremities. This gradually subsided. He was seen by Dr. George Price of Spokane on August 18, who diagnosed an epidemic encephalitis. A spinal fluid examination at this time was negative throughout. During the next three months six spinal drainages were done, with some relief of the severe headaches. His attacks gradually became more violent and he would have as many as nine in twenty-four hours. He was irrational most of the time. He was brought to St. Paul and taken to St. Luke's Hospital, where I first saw him December 18, 1925. He was extremely restless, at times frightened because of hallucinations of sight; he would grimace frequently; when asked to open his mouth and put out his tongue he responded reluctantly, and would keep his mouth open and his tongue protruded indefinitely until finally told to close it.

The neurological examination was negative except that both knee jerks were sluggish and his left arm and leg seemed somewhat tender. At times the patient was oriented, responded rationally, although quite emotional, and cried frequently. At other times his expression would suddenly change, his pupils would dilate, and he would become terrified, clinch his fist, strike out and scream, "There they come, there they come; they will kill me!" and so forth. Occasionally he would see children and men walk around his room, and would complain of many strange noises. At times he would be violent and disturbed.

Because of these attacks it was necessary to keep him in restraints constantly. Under large doses of morphine, luminal, sulfonal, and so forth, he gradually improved, his spells occurred less frequently, were milder, and one could reason with him when they came on, and he would, in a measure, be able to control them. His temperature, pulse, and all laboratory findings were normal throughout. He left the hospital January 7, 1925, and stayed at his mother's home. He would be free from any attacks for days, during which time he was perfectly rational in every way. He requested to be kept in partial restraint, because he was afraid that the attacks might recur. My associate, Dr. Souster, and the patient had been classmates in High School and they had long conversations about the good old times. The patient's memory was normal and he related de-

tailed experiences correctly about their school days. He read the daily papers and conversed intelligently about current events. He was well oriented as to place and time. Because of the fact that his attacks recurred the family decided to take him to the Mayo Clinic on March 1st. He had quite a severe attack on the train and two crying spells during the first two days at Rochester. On March 4th he suddenly brightened up as if awakening from a bad dream. He said that it felt as if something in his head had snapped and he was certain that he would have no further attacks. From that time on he made rapid progress to complete recovery. However, he had complete loss of memory from July, 1925, until he apparently awakened in Rochester March 4, 1926. He called at my office April 2d. He had no recollection of meeting me before, and knew nothing about his stay at St. Luke's Hospital or at his mother's home. When he met Dr. Souster he remembered him as his classmate in High School, but could not recall any visits with him since that time. His entire illness up to March 4th, including the weeks during which he appeared entirely normal and rational, was a complete blank to him.

This patient evidently had a severe psychosis secondary to his prolonged alcoholism, associated with a complete amnesia of eight months' duration. This case well illustrates the extreme toxicity of the present day alcohol upon the central nervous system.

Lemchen[5] reports a similar case following moonshine whisky in whom the amnesic period was of three months' duration and the recovery as complete as in our patient. He believes that these cases are not true Korsakoff's psychosis for in that type the patient seldom recovers entirely without any evidence of dementia and with good insight.

Case 5—Epilepsy, petit mal type, with two periods of retrograde amnesia, of thirty-six hours' and five days' duration respectively.

This patient was a female aged 32, with a negative family and personal history. For the past fifteen years she has had attacks during which she would become momentarily unconscious. Her expression would be blank for a few seconds and then would return to normal. These attacks would occur daily but more frequently during her menstrual period. Following one of these attacks she had a retrograde amnesia of five days' duration. During this period she had assisted her neighbor in the terminal illness and funeral of her husband, but was unable to recall any of these events or other occurrences for five days previous.

About one month later, on her way from Bismarck, North Dakota, to LaCrosse, Wisconsin, she stopped off at St. Paul and was examined at my office. That same afternoon she left for LaCrosse with a friend, and on the train had another petit mal attack. I saw her again one week later, at which time she had no recollection of her previous visit to my office, of her examination, and so forth. She remembered leaving Bismarck, the next station beyond, and getting off at LaCrosse. The intervening period of about thirty-six hours was a complete blank.

Case 6—was of a similar nature but associated with a grand mal seizure.

A male, aged 22, student at the University of Minnesota, gave a negative family and personal history. He had suffered from generalized convulsions since the age of fifteen, averaging about four a year. About five o'clock one afternoon he had an attack of epilepsy, grand mal type, of about fifteen minutes' duration. He gradually regained consciousness, but had no recollection of the events of the day. He recalled arising in the morning, but remembered nothing of his day's work except for notes he found in his books which he had taken during the lecture hours. Careful study of these notes and discussing the lectures with his room mate were of no avail in attempting to restore his memory for that period.

Case 7 was another epileptic who suffered from epileptic equivalents in the nature of epileptic flights of ten and twenty days' duration.

A man, aged 34, was seen in consultation July 2, 1924, and gave the following history of three attacks: His family and personal history was negative. There was no evidence of grand mal or petit mal seizures. The first attack occurred in the spring of 1911 while working on the farm. He disappeared and ten days later suddenly came to and found himself at another farm house about 120 miles distant. The farmer informed him that he had been there a week and had performed his work properly. He had been rather quiet, but apparently normal. The patient had no recollection of how he got there or what had occurred during the interval. In 1917 he enlisted, and saw active front line duty without manifesting any nervous instability. His second attack occurred in the winter of 1920. He was found by some neighbors wandering through the fields in a heavy snow storm. He was dressed lightly, without hat or coat, and seemed confused. He had walked about six miles from home. He was taken home and his confusion gradually subsided. This attack was of about seven hours' duration. He remembered putting his team in the barn about 3 p. m. and had no further recollection until he found himself in bed about 10 p. m. His third attack occurred on March 10, 1924. He drove to town, sold a horse, and evidently received a check for it, which he deposited. He remembers selling the horse, but has no recollection of getting a check or anything further until March 30th. He suddenly came to and found himself in a depot in Chicago. His clothes were filthy, and he had no funds. The station policeman told him that he had been sitting around the depot all day and had acted apparently normal. There was no evidence of any hysterical manifestation in his makeup.

Case 8—Major hysteria, with hysterical flights and six attacks of amnesia of seven months', five months', three days', four days', one month's, and two days' duration, respectively, each attack precipitated by some distressing situation.

The patient is a male aged 30, an attorney, with an

excellent family history except that his mother died of puerperal sepsis when our patient was two years old. He has two sisters. He was educated in private schools and studied law in Georgetown University. During his youth he developed a very independent spirit, wanted his way in everything, and had a violent temper. While in college he was a good mixer and very athletic. He saw active service in France, and was promoted from a private to a first sargeant. He returned to the United States in March 1919. In the fall of 1919 he became a partner in his father's law firm. He married in 1921, his married life was congenial, but he and his wife were extravagant and had constant financial worries. They had one child, born eighteen months after marriage.

While in his father's law office he had periods during which he was quite irritable and manifested a tendency to "blow up" over minor difficulties. In the spring of 1923 he was nominated for district attorney, but was defeated at the election. This was a great disappointment to him. Because of a personal grudge the newly elected district attorney proceeded to bring charges against the patient for wrongfully using funds from an estate of which the patient was administrator. No charges were proven, the relatives made no complaints, and the matter was dropped. This occurred in the early fall of 1923. During the investigation the patient was under great tension and felt quite disgraced because of the charges preferred against him. He began to neglect his business, and felt as if there was "no use." He repeatedly overdrew his bank account and made several business trips without any motive. He had difficulties with his father and was worried because of this. Around Christmas 1923, he suddenly disappeared and regained consciousness January 15, 1924, in a hospital at San Diego, California, about 1200 miles from his home. He had been found apparently unconscious, two days previous, in front of a mountain resort about sixty miles from San Diego. When he regained consciousness he was unable to give any information pertaining to himself or his family. The name of a man in San Diego was found on an envelope in his pocket, who came and identified him. After awhile the patient was told who he was and that he had a wife and child. This information greatly disturbed him and he cried for several hours. His memory gradually returned except for a period from July 1923, to January 15, 1924. He left the hospital February 10th and returned home in April 1924, for five months. At home he stayed around the house, seemed depressed, avoided his friends, and felt disgusted with himself. In August 1924, he worked with a surveying crew for one month. Early in October he went to Colorado to attend to some important legal affairs for his father. He states that this turned out to be a "dismal failure" and that he was greatly disappointed. He remembers going to bed the latter part of October 1924, in Colorado, greatly worried, and then suddenly "came to" in a tourists' camp in Kansas City, April 25, 1925. One of the tourists informed him that he was walking along the road, asked for a ride, and was brought to the tourist camp. There he suddenly fainted but within a short time regained consciousness with a return of his memory.

History from other sources reveals the following regarding this period of amnesia from October 1924, to April 1925: Nothing could be learned of his whereabouts until December 24th. On December 24th he was on a train in New Mexico, introduced himself as John Blank (he did not use his own name) to one of his fellow passengers, told him that he had been a lieutenant in the Coast Artillery, that he had been shell shocked, and suffered with spells of unconsciousness which occurred quite frequently and lasted a week or more. He begged him to take care of him in case he should develop an attack. They registered at the same hotel and took a room together. Within a few days the patient suddenly collapsed and was sent to a hospital. He remained in an hysterical semi-conscious state for four days and then gradually returned to normal. He had no recollection of anything since October 1918. He remained in this hospital until March 10, 1925, and was then taken to another hospital in Kansas City, where he remained until April 25, 1925. He seemed normal in every way. That afternoon he "came to" in the tourists' camp. He was returned to the hospital, his memory gradually returned except for his amnesic periods, and he was discharged May 15, 1925, and advised to go to northern Minnesota to recuperate. He arrived in Duluth June 1st, and lived at one of the smaller hotels until July 1st. He then attempted to do manual labor in the copper mines in northern Michigan. He could not stand the work and lost his job within three weeks. He returned to Duluth quite upset over this failure. He developed a severe headache and applied to the Veterans' Bureau for admission to the hospital because he feared another attack. From here he was transferred to St. Paul, and I first saw him September 10, 1925. He appeared normal in every way, complained of an occasional occipital headache, stated that he had lost confidence in himself because of his repeated attacks of amnesia, and because of his many failures in life. All examinations and laboratory tests were negative. He progressed satisfactorily. After several frank discussions with him about his condition he became more cooperative, regained some of his confidence and asked to be discharged on October 17, 1925. He went to Chicago and visited some old friends, which seemed to upset him. He secured a position as a salesman, making $6 a day. He continued with this for two weeks then began to realize that there was no future in it for him and resigned He furthermore had some difficulties about the adjustment of his government compensation, which worried him greatly. He remembers going to bed in Chicago on November 20, 1925, and found himself in a Duluth hospital three days later. He has no recollection of the intervening period. He remained in the hospital for three weeks, then secured a position as salesman for four weeks, succeeded quite well, but was dissatisfied and discontented with his work About January 20, 1926, he was found in his room in a semi-conscious condition, which continued for four days, with recovery. He left Duluth, arrived in St. Paul, and remembers staying at the St. Paul

Hotel. On February 20th he suddenly "came to" in a hospital in Milwaukee, but has no recollection of what occurred during that month. He requested that he be transferred to the Veterans' Bureau Hospital in St. Paul and arrived here on February 22d. He remained here until May 1, 1926, when he was discharged from the hospital as he wanted to go to Northern Minnesota to recuperate. During his stay at the hospital he was normal in every way except for two day, March 15th and 16th. On March 11th he received a very upsetting letter from his wife and on March 12th a letter from a friend, demanding the payment of a $75 loan. On the evening of March 14th he seemed rather depressed, retired early, apparently slept all night, but could not be aroused next morning. He appeared semi-conscious, resisted attempts to open his eyelids, and to move his arms. After repeated demands he finally opened his eyes, stared, and protruded his tongue. This condition continued for two days then gradually subsided. All findings were negative. He has no recollection of anything that occurred during this period.

The following letter (an exact copy) evidently written on the evening of March 14th, was found at his bedside, and quite clearly illustrates his mental attitude toward life's problems and toward his own incompetency:

"Dear Pal:

"Some say it is the coward who takes the *easiest way* out of a difficulty but I disagree, it takes more courage than most of us have to go on living, making life a daily torture. I am a coward. I go on living my worthless life, hoping somewhere there might be a ray of light in the dark horizon to guide me. I know how you have encouraged me 'Audeces Fortuna Juva' as a motto. I have tried, old pal, but every time I begin to regain my lost confidence, something happens to undermine it.

"Stripping away all veneer and leaving the bare facts, what does the future hold for me? I am nothing but dross; all the steel has been melted out of me.

"Even here in the hospital I do not have any rest. Always something to worry me. No compensation, everything else gone, as you know. Grant crying for payment. Thought I had that arranged for, but alas, today that fell through and now I do not know where to turn. I know, old pal, you would help if possible but I know how you are situated. I tried last winter to come back, but I make a miserable failure, more than that, in my failures make someone else must suffer. Grant will be paid but I can't say when. Oh! but why bore you with this. I must talk to someone, so please bear with me a little while. I don't know why I should be condemned to suffer so. Full conscious that I have all my faculties, yet some damnable lack of coordination has me at least abnormal. Some, as you know, call it a dual personality, a semi-hypnotic state. That may be all true, but God, if I only could get somewhere, where I could rest, where my mind could be relieved of this continuous worry. If people would only let me alone somewhere I did not have to worry where my next meal is coming from. I am tired, want to sleep so will continue this later. Guess I'll take a bath maybe it will make me feel better."

Case reports of hysterical amnesia are encountered quite frequently in the literature. Read[6] published a case in detail in whom a complete retrograde amnesia existed for a period of eight years, secondary to a slight head trauma. Oppenheim[7] cites a similar case in an army officer. Shell shock patients during the World War often manifested periods of amnesia, usually on an hysterical basis and were successfully treated by hypnosis (Thome[8]).

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BIBLIOGRAPHY

1. Heilbrönner: Monats f. Psych. v. Neurol. 17, 1905.
2. Bleuler: Textbook of Psychiatry.
3. Coriat, I.: Abnormal psychology.
4. Shilder, P.: Med. Klinik, 1923, 18, 604.
5. Lemchen, B. L.: Arch. Neurol. and Psychiat., July 1925, 121.
6. Read, C. F.: Jour. Nerv. and Ment. Dis., 58, 6, 513.
7. Oppenheim, R.: Progressive medicine, 32, 189.
8. Thome, J.: Am. Jour. Psych., 86, 437.
9. Lewandowsky: Handbuch der Neurologie.

ALLONAL NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Allonal is a preparation containing a combination of allylisopropyl barbituric acid and amidopyrine mixed with free allylisopropylvarbituric acid and an excess of amidopyrine. The combination between allylisopropylbarbiburic acid and amidopyrine is readily decomposed into its components, and the firm's claims are based on the assumption that Allonal contains these two ingredients. The claim is made that allylisopropylbarbituric acid, "the new and distinctive component," possesses a greater hypnotic power than any of the other well known hypnotics of the barbituric acid series, but that it is relatively less toxic. The Council finds that the evidence cited by the firm does not substantiate this claim, and concludes that Allonal must be considered as the result of an effort to combine in one preparation the hypnotic properties of a member of the barbituric acid series and the analgesic properties of amidopyrine. The firm publishes long lists of conditions said to have been relieved by this combination, the only individualization being the recommendation of "1 to 2 tablets" for some and of "2 to 4 tablets" for others. In none of the clinical reports submitted by the firm does the author refer to observations in which either component of the drug was used separately or in which the relative proportion was varied: the Council holds that the absence of such data deprives these reports of much of their value as arguments for the use of Allonal. The new hypnotic, allylisopropylbarbituric acid, for which great superiority is claimed, is thus made available to physicians only in fixed combination with an antipyretic and analgesic drug which may not be needed and which in itself frequently causes untoward symptoms. The Council finds Allonal unacceptable for New and Nonofficial Remedies because (1) the therapeutic claims advanced are deemed unwarranted by the facts; (2) the name is not descriptive of its composition, and (3) there is no satisfactory evidence that the administration of a mixture of allylisopropylbarbituric acid and amidopyrine in fixed proportion (or of a feeble chemical compound of these two that behaves in the stomach like a mixture) is rational. (Jour. A. M. A., June 12, 1926, p. 1853).

HYDROCEPHALUS*

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Hydrocephalus has hitherto ranked as one of the most intractable and unpromising of the diseases of childhood. A multitude of surgical procedures have from time to time been instituted for the relief of the condition but almost without exception they have failed in their purpose, and the rare occasions on which they have succeeded have left one wondering whether, after all, the success was no more than coincidence—whether, in fact, improvement would have occured if nothing active had been done, for spontaneous arrest of hydrocephalus is an actual, though rare, possibility. This unsatisfactory state of affairs depended largely upon erroneous ideas regarding the etiology of the disease.

As early as 1862 Hilton, in his Lectures on Rest and Pain, described varieties of obstructive hydrocephalus arising from congenital obliteration of the aqueduct of Sylvius, and from occulsion of the foramina present in the roof of the fourth ventricle. The clue to the pathological process in certain types of the disease does not appear to have produced in the past any operative interference of lasting and definite value, and we owe to Dandy and his co-workers the establishment of operative principles which hold out the prospect, as far as we can at present tell, of permanent cure of the disease.

The following short description of the condition was taken from the lectures, demonstrations and writings of Mr. John Frazer, Professor of Surgery of Edinburgh University, Edinburgh, Scotland.

NORMAL ANATOMY AND PHYSIOLOGY OF THE PARTS INVOLVED

It is essential to have a proper idea of the processes involved in the production and absorption of the cerebro-spinal fluid, and of the relationship of the parts connected with its circulation. Such knowledge is fundamental because the development of hydrocephalus necessarily entails an error either in the production, circulation or absorption of the fluid.

PRODUCTION OF THE CEREBRO-SPINAL FLUID

We may assume that the bulk of the cerebro-spinal fluid is derived from choroid plexuses which lie in the lateral ventricles. The method by which the fluid actually is produced from the villi is uncertain. It is not yet possible to say whether the process is one of secretion, filtration or dialysation. The fluid differs so widely from that secreted by most other glands, and it persistently retains its freedom from contamination by such body fluids as bile in jaundice, or by drugs when they are injected into the body, that we must assume that whatever the method of production, certain strong selective actions are at work.

Another possible source of the production of the cerebro-spinal fluid exists in the perivascular spaces. They communicate with the subarachnoid space and therefore the fluid of the former must to some extent be included in the cerebro-spinal fluid.

COURSE OF THE FLUID AFTER PRODUCTION

The fluid circulates along the ventricular system and escapes from it through the medium of the central rounded foramina of Magendie, and the more slit like lateral foramina of Lushcka. It is now in the subarachnoid space, and at first it tends to collect in the large subarachnoid cistern which lies at the base of the brain, the cisterna magna on the dorsal aspect and the cisterna pontis with its various sub-divisions on the ventral aspect.

The value of the cisterns is two fold—they stabilize the pressure of the cerebro-spinal fluid, and they render possible a uniform distribution of the fluid in its further progress over the cerebral hemisphere. From the subarachnoid spaces and cisterns the fluid passes in two directions. A small proportion passes downward through the foramen magnum into the subarachnoid space. The larger proportion escapes upwards between the mid-brain and tentorium cerebelli to be distributed in the wide area of the subarachnoid which covers the cerebral hemisphere. It is in this area that absorption of the fluid occurs.

METHOD OF ABSORPTION OF THE FLUID

It is generally held that there are four media by which the fluid is absorbed, namely, the pacchionian bodies, the arachnoid villi, arachnoid mesothelial cells, and the lymphatic system.

THE SPECIAL ANATOMY INVOLVED

The large proportion of the cerebro-spinal fluid is formed within the lateral ventricle in which lies the bulk of the choroid plexus. The fluid

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May, 1926.

passes by the foramina of Monro into the third ventricle. This ventricle contains a choroid plexus, and therefore it is the site of production of a certain amount of cerebro-spinal fluid. The fluid leaves the third ventricle by the sylvian aqueduct to pass into the fourth ventricle. The lumen of the sylvian aqueduct is somewhat narrower at its two extremities, a point of importance in connection with congenital obstructive hydrocephalus. In the roof of the fourth ventricle are three apertures; the foramen of Magendie which appears during the fifth fetal month and two additional clefts, the foramina of Luschka. Through these three aperatures, and probably through them alone, the system of ventricular cavities and central canal of the spinal cord are brought into communication with the subarachnoid space. Three groups of choroid plexus appear in the roof of the fourth ventricle—a medial and two lateral—and therefore a proportion of cerebro-spinal fluid is formed within this space. Having escaped from the fourth ventricle into the subarachnoid space by the foramina Magendie and Luschka, the fluid is free to pass forward over the hemispheres or caudally into the spinal subarachnoid space.

ESSENTIAL ERROR IN THE FORMATION OF A HYDROCEPHALUS

By the terms hydrocephalus we mean an accumulation of cerebro-spinal fluid within the cavity of the skull. Keeping in view the outline which we have given of formation, circulation and absorption of the cerebro-spinal fluid, we may classify the possible origins of the disease as follows:

1. Excessive production of fluid;
2. Obstruction in some portion of the route along which the fluid circulates;
3. The production and circulation of the fluid remaining normal, there may be an interference with the absorption of the fluid.

Based on these three possibilities, a reasonable and scientific classification of the disease can be made which will include moreover all varieties of the disease.

VARIETIES OF CLASSIFICATION

Hitherto different varieties of hydrocephalus were recognized in describing the disease. For example, hydrocephalus was classified as "acute" or "chronic" according to the rapidity with which the fluid accumulates, or dependent on its association with coincident acute inflammatory reaction in the meningeal structures. Hydrocephalus was spoken of as "internal" or "external," according to whether the fluid accumulates within the ventricular system or in the extra cerebral tissue of the arachnoid spaces. Further, the disease was classified as "congenital" or "acquired," according to the history of its incidence and occurrence. Such an irregular and rambling classification had no proper basis. The occurrence of an external hydrocephalus as a primary condition distinct from a co-existing internal hydrocephalus has been questioned, and its occurrence is universally accepted as a very rare condition. The classification of "acute" and "chronic" hydrocephalus was specially important. Apparently in the minds of many observers acute hydrocephalus was synonymous with the development of basal meningitis. But, whatever the origin of the condition, all varieties of hydrocephalus are chronic in their formation, though the actual period of time involved may vary within wide limits.

Something is to be said for the method of classification into "congenital" and "acquired" varieties of the disease. A considerable proportion of cases can be without much difficulty, grouped into one or the other of these classes—but the independent use of the two terms is not sufficiently descriptive of the condition of affairs.

The classification suggested by Dandy is complete but it includes types of the disease which, if they actually exist as clinical entities, have little or no relationship to surgical treatment.

On the grounds above stated Frazer suggests the following as a more suitable classification:

Hydrocephalus due to
- a—Congenital anomalies
- b—Ventricular obstruction
  1. Between one lateral and third ventricle.
  2. Between both lateral ventricle and third ventricle.
  3. Between the third and fourth ventricle.
  4. In the roof of the fourth ventricle.
- c—Extra ventricular obstruction
  In the subarachnoid space.

The above is a simple, expressive and accurate classification from the anatomical and physiological points of view. It is also very significant practically, for each type has its distinctive and appropriate treatment.

ETIOLOGICAL PATHOLOGY

1. Congenital hydrocephalus.

Two varieties of hydrocephalus have been encountered at birth, and therefore the varieties may be described as examples of congenital types:

A. There is a well developed form in which the head is considerably enlarged at birth and which is associated with an error in the development of the central nervous system and which permits an escape of fluid from an open sylvian aqueduct. The resulting hydrocephalus is of an external type, is not amenable to surgical treatment and is rarely compatible with post-natal life for any prolonged period.

B. The variety of hydrocephalus which accompanies a spina bifida. At birth attention is naturally directed to the spinal error, and if the spina bifida is operated on and the defect closed, the pre-existing hydrocephalus soon becomes noticeable by the rapid increase in the size of the head. This variety of hydrocephalus is also of the extra-ventricular type.

2. Ventricular hydrocephalus resulting from tumor, atresia and adhesions.

Tumors usually occur at the cerebello-pontine angle and the resulting hydrocephalus is not a primary one.

Atresia and adhesions have a common basis in so far as both varieties have an inflammatory origin, plastic or infective. The possible origin of ventricular hydrocephalus may be dependent upon intra-cranial birth hemorrhage, a former sub-acute inflammatory meningeal condition, or the lepto-meningitis which develops in association with congenital syphilis.

3. Etiology of extra-ventricular hydrocephalus.

Dandy's view as to the anatomical lesion responsible for this type, namely, pia-arachnoid adhesions which shut off the absorbing area of the cerebral subarachnoid space from the posterior cranial fossa, has a great deal to recommend it. The possibility that there is an over production of cerebro-spinal fluid has never been established; the only other possible explanation is a diminished absorption of the cerebro-spinal fluid. The difficulty has been to explain what prevents the absorption of the fluid. The actual origin of the adhesions in extra ventricular hydrocephalus is that already discussed in relation to the ventricular type, except at birth hemorrhages probably do not play a part. Basal meningitis, simple or specific, is the more likely origin.

PHYSICAL EXAMINATION OF THE CASE

In the majority of cases it is sufficiently obvious that a hydrocephalus is present but a further examination is necessary to properly classify it as regards its etiology and type. Recognizing that practically all cases of hydrocephalus are obstructive, it is necessary to demonstrate whether the obstruction exists somewhere in the ventricular system up to and including the point of exit of the fluid from the fourth ventricle, or whether it exists in the subarachnoid spaces. Three procedures are followed in demonstrating the answer to this question:

1. Lumbar puncture may give some indication, but not a definite answer to the question. Intra-ventricular hydrocephalus more often shows low tension in the spinal fluid and extra-ventricular hydrocephalus on increased tension, but variations exist, and occasionally this is reversed.

2. A neutral solution of phenolsulphonephthaline is injected into one of the lateral ventricles and in five minutes or more, if the indicator can be recovered by spinal puncture it can be concluded that the hydrocephalus is not due to an intra-ventricular obstruction. The non-appearance of the indicator in the spinal fluid may be taken as demonstrating an intra-ventricular hydrocephalus.

3. The recovery of phenolsulphonephthaline from the urine subsequent to its injection into the ventricle is a matter of importance, for if a ventricular hydrocephalus exists, practically none of the indicator will be recoverable within a reasonable time (two hours), while if an extra ventricular hydrocephalus is present, the indicator will be recoverable, though not to the same degree as in a normal case.

Investigation by these methods, and more especially by the second, carries the observer a step forward, in so far as he is now able to classify the case of hydrocephalus into a ventricular or an extra-ventricular type. If it should happen that the case is an extra-ventricular one, it is not necessary to proceed further with the routine examination. If, however, our original investigation has shown that the hydrocephalus is a ventricular one, further details must be determined

before an intelligent operative treatment can be undertaken.

The degree of hydrocephalus must be known, and the situation of the obstruction must be localized. This knowledge is gained by the method of ventriculography. One lateral ventricle is punctured, and to the needle an accurately fitting "record" syringe of 20 c.c. capacity is fitted. The cerebro-spinal fluid is slowly recovered from the cavity of the ventricle, and when 20 c.c. are evacuated, a corresponding amount of air is injected into the ventricle, using the empty record syringe for this purpose. In a hydrocephalus of moderate size (eighteen to nineteen inches in circumference) 70 to 80 c.c. of fluid is recovered, replacing the fluid with a corresponding quantity of air.

Radiograms are now taken with the head in three different positions—right and left lateral and with the head hanging downwards so that the skull base is at the highest level. The first plate will show the outline of one lateral ventricle, the second will demonstrate the opposite ventricle—assuming that the foramina of Monro and the third ventricle are patent—while the third plate will illustrate the third and fourth ventricle and the iter.

TREATMENT

If the efficient treatment of hydrocephalus is to give us satisfactory results it must be carried out before the expansion of the head has become too marked. There is nothing to be gained from operating on a child if the white matter of the brain is already reduced to a shell. No definite limit can be fixed; it must be left a good deal to personal judgment; but an increase in circumference measurement up to three inches above the normal has been found to be within the range of satisfactory post operative recovery. It is obvious that a very clear distinction must be drawn from the operative point of view between the ventricular and extra ventricular varieties. Both are certainly obstructive in nature, but while one (ventricular) is localized and accessible, the other (extra ventricular) is diffuse, and practically inaccessible.

If the hydrocephalus is of the ventricular variety, experience has shown that the only efficient way of treating the hydrocephalus is by removing the obstruction, and so opening up the normal passage for the circulation of cerebro-spinal fluid. All examples of ventricular hydrocephalus, with the exception of the very rare first and second degrees, are operated on by the occipital route. The essential feature of the sub-occipital operation is to expose that portion of the ventricular system which is most accessible, namely, the roof of the fourth ventricle, and through this region to deal with or remove the obstruction which exists. If the hydrocephalus is of the fourth degree it is the custom of Frazer to remove a diamond-shaped area of tela choroidea with fine spring forceps and eye scissors fitted with long angle handles. If it should happen that the hydrocephalus is of the third dgree the obstruction in the iter is generally at one or the other extremities. If a fine rubber catheter will not pass, a millimetre probe is used to open up the closed communication.

It has been found unnecessary to leave a catheter in the iter as it seems that the restoration of the flow of the cerebro-spinal fluid is sufficient to keep the channel open. If this operation is to be a successful one, the relief of the obstruction must be followed by a most careful closure of the wound. If the tension in the post-operative period becomes marked, a ventricular puncture should be practiced and if necessary repeatd.

TREATMENT OF EXTRA VENTRICULAR HYDROCEPHALUS

The obstruction in this type is a widespread adhesive one at the base of the brain, and it is therefore inaccessible to direct removal. It has to be borne in mind, however, that certain cases of extra-ventricular variety show a spontaneous arrest of the disease, a possibility which can never be hoped for in the ventricular variety. At the present time attempts at treatment have been directed towards diminishing the production of the cerebro-spinal fluid to such an extent as to bring it within the power of absorption which exists, for of course a certain degree of absorption still continues. Dandy has advised the removal of the choroid plexus within the lateral ventricle, and he has published successful results in several cases.

Intra-ventricular plexectomy is an exceedingly grave operation, and there is no physiological proof that removal of a limited amount of choroid plexus proportionately diminishes the production of the cerebro-spinal fluid. Stils suggested the possibility of diminishing the produc-

tion of the fluid by ligation of the common carotids and in 1898 and again in 1912 he reported favorable results from this operation. It is clear, of course, that it is only the extra-ventricular variety which will benefit by this procedure; its employment in the ventricular variety will inevitably lead to disappointment, and this may to some extent explain the adverse criticism which the method has received. Frazer treats all his cases in this manner and his results have been sufficiently promising to warrant the continuation of the method.

RESULTS

The results of the above treatment by Frazer have been in the ventricular type fourteen per cent cured, and in the extra-ventricular type fifty per cent markedly improved. By cure is meant that after a period of seven months the head is diminished in size, the ossification is apparently complete except at the anterior fontanelle. The children seem to be intelligent and in appearance indicate normal development.

THE BLAIR BELL LEAD TREATMENT

And while I am offering this counsel in respect to the prevention of cancer, it may be well to speak of another startling announcement which was made a few months ago. I refer to the Blair Bell lead treatment for the cure of cancer. Prof. Blair Bell is a distinguished gynecologist of Liverpool, who has a method of treating cancer patients with colloidal solutions of lead and has accomplished some remarkable results. Associated with him are a number of other physicians of good standing. Reports giving some of the details of the treatment and the results of the work have been published in the *British Medical Journal*. Briefly many persons declared to be incurable by means of surgery and irradiation have been made well. At the same time, a good many have died. The theory is that the lead attacks the cancer tissues and destroys them when given to the patient in doses too small to destroy the normal health tissues. It is a matter of great delicacy to determine and administer the proper dose. Dr. Blair Bell, in all his utterances, lays great stress upon this matter. It is said that no one but himself ventures to administer the treatment. The lead cure for cancer is still in an experimental stage, as every one connected with it freely acknowledges. The work which has been done offers, however, a shred of hope which scientific investigators, the medical profession and the general public are eagerly seizing upon. (Am. Soc. Control cancers, July, 1926.)

MEDICAL LEGISLATION*

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"Life is not mere living, but the enjoyment of health." Martial, Epigrammata.

"Oh health; health; the blessing of the rich; the riches of the poor; who can buy at too dear a rate, since there is no enjoying the world without thee. Be not then so sparing of your purses, honorable gentlemen."—Ben Johnson, Volpone, Act 2.

Utterances like those quoted could easily be multiplied if it were the sole purpose of my address to prove from history or literature that individual or public health has always been highly esteemed by all enlightened men in all ages, whether in antiquity or modern times. And while in our own country our illustrous Benjamin Franklin coined the slogan, that "Public health is public wealth," it is nevertheless a painful fact, well known to every student of medical history and to every practitioner of medicine of some years' of experience that proper legislative enactments embodying a true appraisal of this priceless blessing have been very tardy, and the funds appropriated for securing, maintaining and making more general this happy condition have been rather scanty, yea, at times and in some of our states even niggardly. Whatever beautiful words have been spoken or written in praise of health, individually or collectively, since the dawn of time and up to our present era fade away into nothingness when contrasted with the public records and facts regularly written in our legislative halls. And what are these facts right here in Minnesota? You all remember that in the fall of 1924 we had a disgraceful epidemic of smallpox which for several months held sway all over the state, and thus disturbed our tranquility of mind as well as our long cherished belief of living in a cultured and well governed state. Minnesota is a rich state, as evidence of which I need only mention that in 1917 the assessed value of all real and personal property in the state amounted to more than two and a half billions of dollars. Great as this sum is it sinks in to a modest figure when compared with the economic value of the human beings that inhabit this state.

*Read before the Wright County Medical Society, Buffalo, Minn., May 12, 1926.

During the last world war our federal government placed a valuation of $10,000.00 on every soldier enlisted or drafted, and if we apply this figure as representing the economic value to the state of every human being within the state, and place the total population at 2,700,000 we arrive at the bewildering sum of twenty-seven billions of dollars as the capital wealth represented by our population. The duty as well as the care of looking after a going concern with such immense capital, involving real, personal and human values as stated, we, the citizens, delegate to our government, elected every second year. Strange to relate, neither the people nor the state constitution have provided adequate recognition for the proper safeguarding of the human element, constituting by far the greater portion of the total capital. In the governor's cabinet the railroads and allied interests are represented by a commission, consisting of three members, duly elected. The attorney general represents the state in all legal matters, while the state auditor and the state treasurer are concerned with all real property in the state, and the taxes to be levied on them and collected. The duties of the secretary of state are rather difficult to define briefly because he is not only the responsible officer who countersigns all documents signed by the governor, but his time is also given liberally to issuing charters to corporations and licenses to automobiles.

Neither in the state government nor in the federal government has the tremendous importance of public health been recognized by a distinct cabinet member, chosen from the medical profession. To be sure, we have in our state a commission, appointed by the governor, the state board of health, but really and speaking charitably this commission is not organized for effective work, nor is it supplied with sufficient authority and funds in keeping with the important task allotted to its supervision. And finally our state board of health cannot expect coordinate efficient work out in the state when the respective minor political units—the counties—do not centralize all health-work in the hands of one competent and interested medical man. At present the county looks on in silence while the cities and villages within the county appoint their own local health officers, frequently a friend or for years the family physician of some of the council members, but otherwise not especially fitted for this particular kind of health work.

From what I have submitted of an analysis of our state health legislation it will be manifest that I favor a revision that will give to us a public health department supervised by a secretary of health who may be elected by the people or appointed by the governor after recommendation by our state medical association. Merit and knowledge alone must be the guiding requirements for creditably filling this position. To obtain coordinate efficiency all over the state it further follows that it must be incumbent upon the secretary of health to appoint all county health officers. A compulsory vaccination law should be passed, and finally sufficient funds must be appropriated so that the various subdivisions of such a department of health can functionate properly, thus guaranteeing the citizens of the state protection from preventable diseases. Even though this programme of mine may sound too idealistic to ever be put in operation, I am convinced that a medical profession not hampered by obstructionists either sectarians or the followers of various incredible systems that an ill advised legislature has from time to time recognized and licensed, could and would eventually succeed in placing on our statute book a health law that would be a credit to ourselves and our state. By conferring a perennial blessing upon our citizens through increasing our state of health and reducing our mortality from both preventable and degenerative diseases such a law would be counted the best investment ever made by the state. Certain it is that in our day and age public health is purchasable, and such being the general concensus of opinion our state medical association can with good grace address itself to our legislature in the words of Ben Johnson, already quoted at the outset of this review. Our state board of health which has the supervision of our public health was created by legislative enactment in 1878 so far as I have been able to ascertain, and at present in conformity with the amended law of 1923 consists of nine members. Not to dwell any longer upon this particular legislation I beg leave to refer to a former address of mine dealing with the same subject and published in April 1919 in Medical Insurance and Health Conservation.

In our further study of medical legislation in our state we find that the next move made by our legislators also took place in 1878, when a state

board of medical examiners was created by law. This legislation was termed "An act to regulate the practice of medicine," and at present it is safe to say that every state in the union has placed on its statute book a similar act whereby the people have sought to protect themselves against unworthy and irresponsible practitioners. In this manner doctors, both good and bad, have been singled out as a class on which the people through their legislatures have imposed certain restrictions —contrary to the federal constitution—and have demanded compliance with certain requirements before any member of our profession could lawfully make use of his training, knowledge and experience in any state. For further detailed analysis of the correctness of this act I must refer you to an article of mine in the St. Paul Medical Journal for 1906, where (page 770) under the heading "Reciprocity in Medical Licensure" I submitted my reasons for not acquiescing in this kind of state medical legislation. My viewpoint has not been altered in the intervening years; and as deeds speak louder than words I now observe with pleasure a more general acceptance by a number of states of medical graduates who have successfully passed the examination given them by our National Board of Medical Examiners; and thus it comes to pass that in a round about way the soundness of my argumentation twenty years ago is sustained. If then it be permissible to say that our state legislature erred in 1878, when a commission, a political body of seven men appointed by the governor, was granted authority to license medical men, must we not censure the people's representatives, the legislators, much more for recognizing and lending the State's good name and reputation to inferior or sham systems of the healing art?

The first painful breakdown took place when the Osteopathic State Board of Examiners was created in 1903 by a law enacted by our legislature and signed by our governor, and not very many years later the legislature put its stamp of approval on a far more halfbaked system when in 1905 a board of Chiropractic examiners was proposed. Fortunately for the state we had at that time a real governor, the Honorable John A. Johnson, who promptly vetoed this law and thus for some time saved the face of our state and compelled this sectarian cult to keep hands off in Minnesota.

Subsequent events tell us however that another legislature and another governor jointly committed the sin of fastening this incredibly loose-jointed system upon our people in spite of vigorous protests from the medical profession which cannot help but feel greatly humiliated by these legislative class measures begun in 1878 and culminating in the recognition of the chiropractors.

Aside from the medical practice act and its various subsequent revisions it cannot be said that the legislature has been overworked in the interest of the medical profession; in fact there would seem to be an utter void in the records of our legislative assemblies so far as medical measures are concerned up to last year when our profession by united efforts and the admirable generalship of our present state president, Dr. Herman Johnson, succeeded in obtaining a long sought relief when by legislative enactment it was decreed that actions for damages in malpractice suits must be commenced within two years of the alleged damage and not as heretofore within six years.

Inasmuch as I have so far confined myself wholly to the medical legislation passed by the legislature of our state I must decline to yield to the temptation to also give a review of whatever federal medical legislation we have been "blessed" with during the last ten to fifteen years. Suffice it to say that since the passage of the Harrison law and the prohibition law the doctors of our country have suffered a serious curtailment in exercising the rights and privileges of their license which doctors in other civilized countries still possess. A more extended analysis of this congressional meddlesome interference I have given in my paper "The doctor and his license" published May 15, 1923, in the *"Journal-Lancet"* to which interested parties are referred.

Taking it all in all and summing up the results of both state and congressional medical legislation it may be frankly admitted that the life and practice of a doctor of medicine now more than ever has ceased to be an unalloyed joy. If by reason of our state legislation we are not to sacrifice our professional training and time honored ethics for base commercialism it will be due exclusively to our inborn love for serving our fellowmen while still obeying the call to duty that first thrilled us and made us decide upon a life career as a follower of Aesculapius and his art.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

LICENTIATES OF APRIL, 1926

BY EXAMINATION

Name	School of Graduation	Address
Berglund, Hilding	Karolingian Med. & Surgical Inst., Sweden, 1916	University of Minnesota, Minneapolis.
Biersborn, Byron Maxwell	U. of Minn. M. B. 1925	University Hospital, Minneapolis.
Birkeland, Ivar Wessel	Royal Fredk. U. of Oslo, Norway, 1924	Scenic, Washington.
Bloomberg, Clarence Edward	U. of Minn. M. B. 1926	329 Union, SE., Minneapolis.
Bodine, Marc Williams	U. of Pa. M.D. 1924	Rochester, Minn
Branley, Bernard Lincoln	U. of Minn. M.B. 1926	610 W. 32nd St., Minneapolis.
Brown, Felix Manning, Jr.	Vanderbilt, M.D. 1924	Rochester, Minn.
Cervenka, Chas. Francis	U. of Minn. M.B. 1926	603 E. River Road, Minneapolis.
Clark, Daniel Maurice	U. of Minn. M.B. 1926	St. Mary's Hospital, Duluth, Minn.
Dordal, John	U. of Minn. M.B. 1925	605 Erie, SE., Minneapolis.
Felland, Oscar M.	U. of Minn. M.B. 1926	General Hospital, Minneapolis.
Green, Geo. Francis	U. of Mich. M.D. 1924	Rochester, Minn.
Heiam, Wm. Conrad	U. of Minn. M.B. 1926	329 Union, SE., Minneapolis.
King, Jos. Thos.	U. of Minn. M.D. 1925	510 Ontario, SE., Minneapolis.
Loney, Wm. R. R.	U. of Minn. M.B. 1925	3800 Portland, Minneapolis.
Malmgren, Geo. E.	U. of Minn. M.B. 1926	254 Maria, St. Paul.
Netz, Lester W.	U. of Minn. M.B. 1926	4309 Colfax, Minneapolis.
Peterson, Herbert Wm.	U. of Ill. Cert. Med. 1925	1514 E. 18th St., Minneapolis.
Pollard, Donald W.	U. of Minn. M.B. 1926	General Hospital, Minneapolis.
Rowles, Everett H.	U. of M.D. 1926	Swedish Hospital, Minneapolis.
Shugrue, John Joseph	Georgetown, M.D. 1919	Rochester, Minn.
Stein, Raymond James	U. of Minn. M.B. 1926	Holdingford, Minn.
Stephens, Brooks Palmer	U. of Kansas, M.D. 1921	Rochester, Minn.
Vandersluis, Harold H.	U. of Minn. M.B. 1926	Fergus Falls, Minn.
Venables, Alex. Evan	U. Manitoba, M.D. 1917	1339 Sargent, St. Paul.
Waller, Riley Moore	Wash. U. Mo. M.D. 1920	Rochester, Minn.
Weinauer, Heribert Friedrich	U. of Munich, 1925	Binghamton, N. Y.
Werner, Robert Frederic	U. of Minn. M.B. 1926	629 Washington, SE., Minneapolis.
Westby, Magnus	U. of Minn. M.B. 1926	329 Union, SE., Minneapolis.
Wilken, Paul Arthur	U. of Minn. M.B. 1926	3912 Pleasant, Minneapolis.
Yaeger, Wilbert Wm.	U. of Minn. M.B. 1926	Sanborn, Minn.

BY RECIPROCITY

Alvarez, Walter Clement	Cooper Med.Coll.Cal.M.D.1905	Rochester, Minn.
Gehlen, Jos. Nicholas	Creighton, M.D. 1918	Lowry Bldg., St. Paul.
Grogan, John Sebastian	Northwestern, M.D. 1914	Wadena, Minn.
Havens, Fred Z.	Rush, M.D. 1915	Rochester, Minn.
Jordan, Elverse Morris	U. of Texas, M.D. 1923	Rochester, Minn.
Kjelland, Andrew A.	U. of Minn. M.D. 1910	Hatton, N. D.
Leitch, Neil McLean	U. of Ill. M.D. 1925	Rochester, Minn.
Ready, Frank Lane	U. of Neb. M.D. 1925	727 E. 18th St., Minneapolis.
Ritter, John Franklin	U. of Mich. M.D. 1895	Maquoketa, Ia.

NATIONAL BOARD CERTIFICATE

Barker, Nelson Waite	Rush, M.D. 1925	Rochester, Minn.
Iler, Russell Hills	Cornell, M.D. 1924	Rochester, Minn.
Kappes, Louise Osborn	U. of Mich. M.D. 1924	Rochester, Minn.
Nomland, Ruben	Rush, M.D. 1925	Rochester, Minn.
Rentschler, Calvin B.	U. of Pa. M.D. 1924	Rochester, Minn.
Rentschler, Edwin B.	U. of Pa. M.D. 1924	Rochester, Minn.
Dean, Arthur Clark	Jefferson, M.D. 1917	Crookston, Minn.

MINNESOTA MEDICINE

OFFICIAL JOURNAL MINNESOTA STATE MEDICAL ASSOCIATION, SOUTHERN MINNESOTA MEDICAL ASSOCIATION, NORTHERN MINNESOTA MEDICAL ASSOCIATION, AND MINNEAPOLIS SURGICAL SOCIETY

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VOL. IX AUGUST, 1926 No. 8

EDITORIAL

The Hospital Interne Year

The general hospital in which the writer has come in contact with hospital internes for the past seven years has had very few interne problems. Consequently the remarks here offered must not be construed as an isolated criticism arising from personal relationships. It is desired to call attention to some situations pertaining to the interne's hospital year which are unfortunate and possibly unavoidable.

No one has all the facts pertaining to the problems involved, but unless we begin to think about them we shall note much delay in their accumulation.

In the first place, while the courses in medicine are somewhat longer than twenty-five years ago, it is doubtful if they are notably more difficult or exhausting. The "pre-medic" preparation is said by some to be too rigid; too intensively scientific—meaning thereby the basic sciences—in a word, not enough humanitarian. Emerson, of Indiana, has elaborated this idea very well. But whether the courses are excessively rigid or not, it has been noted by many that the interne in the hospital year when he should be full of receptivity shows unmistakably that he is "fed up." Like a young and surfeited lion, he is not so much seeking a continuance of the same wisely chosen mental pabulum culled out by those who know full well the proportion and balance he needs, but he craves some blood-red food of his own choice and seeking, and obviously he is attracted to the technique of practical surgery. He is "tired of lectures"—and we may say lecturers. Much that he observes neither meets with his approval nor stimulates his enthusiasm. Yet he is a totally unfinished product and as a rule he knows it full well.

One can sympathize with the interne a great deal and deeply regret that it seems impractical for him to have two or three years of general practice before he enters the hospital for what should prove to him great inspiration through all his years of practice.

Perhaps it is quite too personal a matter even to refer to such a bilogically sound urge as the early marriage even of medical students and internes; quite safer is it perhaps to allude to that universal trend—the acquisition of a motor car. Twenty per cent of some of our recent senior classes at the University are said to have been married; even twenty years ago the ownership of an automobile was said seriously to interfere with scholarship.

Time should be taken with the junior students sometime during the early part of that year to thoroughly impress upon them the portion of their under-graduate education which they are expected to get out of their fifth or interne year. It would seem that this early mention (often repeated) might induce them to adopt an attitude toward the hospital in which they serve, paving the way to an understanding of the responsibilities as well as the opportunities awaiting them.

Perhaps Emerson is right—possibly pre-medical students should have a far wider and looser training along general lines. Then toward the end of their Course and in the hospital they should expect and tolerate very close apprenticeship.

E. L. T.

Dr. Russell D. Carman

The passing of Dr. Carman has been a tragic loss to his many friends and the profession at large. A leader in his chosen specialty and of international reputation, his contributions to our knowledge of Roentgenology and especially that of the gastrointestinal tract have been most important.

Untimely as his death has been, it was not unexpected either by his more intimate acquaintances or by himself. A number of years ago he had undergone a cholecystotomy and his stomach distress since then had been attributed to this previous trouble. Last fall the diagnosis of an inoperable carcinoma of the stomach was made by Dr. Carman himself and the diagnosis proved only too correct. The nature of the disease was discovered shortly before the meeting of the Interstate Post-graduate Assembly held in Saint Paul in October. Except for a slight loss of weight Dr. Carman at that time appeared in perfect health. As he addressed the meeting few knew what must have been his state of mind. His confessed dread of the development of just such a malady only makes his fortitude in meeting the situation as he did the more admirable. The soldierly manner in which he carried on to the end attending to his work as much as he could only proved the indomitable spirit of the man.

There is a tragic pathos in a situation where one who has devoted such energy to the x-ray diagnosis of stomach maladies should develop an inoperable stomach carcinoma. The limitations of medicine and surgery are only too well illustrated. The possibility of an early detection of the lesion by a periodic health examination has arisen in the minds of some and we are informed that a rule has been made in the clinic in which he worked providing for a complete examination of each physician on his birthday. This procedure should be adopted by every physician in the state.

Genial in disposition and easily approached, Dr. Carman was ever ready to do a favor even for those who had least claim on his time, as the writer can attest from personal experience. The profession of Minnesota and particularly the field of Roentgenology have lost a leader, cut down in his prime and before he had given his full contribution to the world's storehouse of medical knowledge.

The Health of Young Doctors

We know of no survey ever having been made of the health of undergraduates and internes. Among the internes at a Twin City hospital last year one interne developed pulmonary tuberculosis, one had a gastric hemorrhage due to essential hypertension and one was laid up for months with a generalized infection. This was in addition to a number of instances of infectious diseases among the internes incident to exposure. In another institution the number of internes incapacitated by illnesses was striking. In a medical class of thirty-five members graduated from the University comparatively recently four have died of pulmonary tuberculosis, one other has had a severe pulmonary hemorrhage and two more have had active pulmonary tuberculosis. It is evident that more attention should be paid to the health of undergraduate medical students.

The medical student devotes his time to the study of the cause of disease, its cure and prevention. While admittedly many diseases are beyond the power of the individual to prevent we know that proper attention to the rule of hygienic living will ward off the development of some morbid conditions. As a physician grows older he realizes the necessity for recreation and more particularly the need for mild outdoor exercise. Witness the participation by members of the profession in such activities as golf and hunting. This is an example of practicing what we preach.

The medical course is longer than it used to be and facilities for shortening the actual time spent in undergraduate training by attending school during the summer months may or may not be a step in advance as far as health is concerned. If the medical graduate is prepared to tackle his life work with a physical make up below par it might have been wiser to have interspersed a few more vacations along the way.

The young doctor has to learn that he as well as his patients must obey certain laws of health. It has been said that one does not know how to take care of his health until he has been at some time seriously ill. The extravagance of youth applies also to his unwise expenditure of energy in activities harmful in a physical way.

We believe that an investigation of hygienic conditions among undergraduate medical stu-

dents would bring to light infringements of Nature's laws which if corrected would be to the benefit of those embryo physicians.

COMMUNICATIONS

To the Editor of Minnesota Medicine:—

The Minnesota Public Health Association wishes to announce that agents of the Children's National Tuberculosis society, who are selling a magazine called "Our Tuberculosis Children," have no connection with the official state or national tuberculosis organizations. Reports received at our office indicate that such claims have been made, and this letter is to inform the public that in making contributions for the magazine, they are not supporting any state tuberculosis work. A telegram from the National Tuberculosis association states that it "cannot indorse, countenance, or approve the Children's National Tuberculosis Society."

E. A. Meyerding, M.D.,
Executive Secretary,
Minneapolis Public Health Association.
Saint Paul, Minnesota.

PEKING UNION MEDICAL COLLEGE CARRIES ON

"Peking Union Medical College is a unique item in the program of the Foundation, the only case in which complete responsibility has been assumed for the building, staffing, and temporary maintenance of an institution. But from the outset the Foundation made clear that its purpose was not to create a permanently foreign institution in China, but to transform the College gradually into a Chinese medical center with a Chinese staff and ultimately a Chinese board of trutsees in complete control. It was recognized that this transition would have to be made slowly and carefully, as Chinese doctors and others proved themselves capable of caring for, patients, teaching students, carrying on research, and doing administrative work.

"The results of this policy have begun to show. In 1920, of a teaching staff of thirty-one the Chinese numbered nine, or 20 per cent; in October, 1925, the percentage of Chinese was 53. More significant still is the fact that Chinese doctors now occupy positions of leadership in two departments. One of the two or three most important posts in the entire institution, that of medical superintendent of the Hospital, is efficiently filled by a capable Chinese.

The setting up in coöperation with the College of a health center under local auspices in Peking serves at least two important purposes. It affords a demonstration for the first time in China of a modern health organization with its clinic, records, visiting nurse service, and educational features, and it provides a means of giving medical undergraduates a much needed practical training in the meaning and methods of public health and preventive medicine.—Rockefeller Foundation.

OBITUARY



DR. RUSSELL D. CARMAN

Russell Daniel Carman, M.D., F.A.C.R., F.A.C.P., died at his home in Rochester, Minnesota, June 18, 1926. He was born in Iroquois, Ontario, March 18, 1875. As a child he accompanied his parents to Butte, Montana, and after a brief stay, to Saint Paul, Minnesota. Attending the public schools in Saint Paul, he later took his premedical studies at the University of Minnesota but took his degree of M.D. at Marion Sims-Beaumont Medical College in St. Louis in 1901. The following year he took postgraduate work in orthopedics at Johns Hopkins and in the summer of 1903 at Harvard.

In 1903 Dr. Carman began practice in St. Louis. A surgeon at first he began devoting his attention to Roentgenology in 1907, becoming Assistant Professor of Roentgenology in 1909 in his alma mater. January 1, 1913, he took charge of the Department of Roentgenology at the Mayo Clinic, in which capacity he remained until his death.

At one time he was Lieutenant in the U. S. Medical Corps. Besides being a member of the Olmsted County Medical Society, Minnesota State Medical Association and American Medical Association, he was a member of the American College of Physicians, American College of Radiology (Past President), Radiological Society of North America (Past President), American Roentgen Ray Society (President-elect), International Congress of Radiology, Roentgen Society of London,

Nordisk Forenning for Medicinsk Radiologi, Alpha Kappa Kappa, Sigma Xi, various Masonic bodies and the Shrine.

Dr. Carman was married in 1904 to Miss Sadie L. Butler of St. Louis, who with his mother, Mrs. J. J. Oliver of Saint Paul, survives him.

DR. A. C. TAYLOR

Dr. A. C. Taylor, 77 years old, pioneer physician of Duluth, dropped dead at his home Wednesday, April 21, 1926. Death was declared due to apoplexy.

The body was found by W. S. McCormick, city finance commissioner, who said that Doctor Taylor had gone to his garage to get his automobile and was returning to his apartment when he was stricken. He was planning on taking a trip to his summer home with his wife, it was said.

Doctor Taylor was associated in the practice of medicine with his son, Dr. C. W. Taylor, with offices in the New Jersey building. He had been engaged in practice for more than 50 years.

Doctor Taylor came to Duluth from Manchester, Michigan, in 1890, having lived there following the receipt of his degree at the University of Michigan. He was a member of county and state medical societies, and of the American Medical Association.

May 1, 1923, Doctor Taylor celebrated his fiftieth anniversary of professional practice and, at the same time, he celebrated, with Mrs. Taylor, their fiftieth wedding anniversary. They were married at Manchester shortly after Doctor Taylor received his degree.

Doctor Taylor was the local physician for the Duluth & Iron Range railroad and was a staff physician at St. Mary's hospital. During the World war, he was chairman of the advisory board for the local draft boards.

Besides his widow and son Doctor Taylor is survived by a daughter, Mrs. Arthur Hanford, Duluth, and two other sons, Lyman Taylor of Cleveland, Ohio, and Asher Taylor of Brainerd.

DR. JOHN HALL CROWE

Dr. John Hall Crowe, 58 years of age, pioneer physician of Virginia, and for many years deputy county coroner and poor commissioner, died Saturday, April 4, 1926, at the University hospital, Minneapolis. He had been ill since January 1 and death was caused by intestinal thrombosis.

Born in Peterborough, Ontario, on November 17, 1868, John Hall Crowe came to the United States while yet a young man and completed his medical education at Rush medical college, University of Chicago, in June, 1901.

He took up the practice of medicine in Superior, under Dr. W. E. Ground, of Virginia, remaining there nearly two years. He then came to Virginia where he established his practice.

In 1904, Doctor Crowe was appointed city health officer, holding the post for two years. In 1908 he was reappointed for two years, and again in 1912 he started a four-year term.

Taking an active part in civic and fraternal affairs of the community, Doctor Crowe became a charter member of Virginia lodge No. 264, A. F. and A. M., at its inception in 1906. He was also a member of Virginia Chapter No. 77, Royal Arch Masons, and Eveleth commandery No. 35, Knights Templar, and of Virginia lodge No. 1003, B. P. O. E.

He was master of the Virginia Masonic lodge in 1909 and high priest of the R. A. M. chapter from 1911 to 1912.

Survivors are his window and one brother, residing in Davenport, Iowa.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

NORTHERN MINNESOTA MEDICAL ASSOCIATION

In the June issue of Minnesota Medicine appeared the program of the Northern Minnesota Medical Association which will hold its annual meeting at Crookston, Minnesota, Monday and Tuesday, August 9 and 10, 1926. The Red River Valley Medical Society will act as hosts and numerous social activities have been planned in addition to an unusually fine scientific program.

The banquet will be held Monday evening, August 9, at which the president, Dr. O. J. Hagen of Moorhead, Dr. Morris Fishbein of Chicago and Dr. Arnold Schwyzer of St. Paul will speak. A dance will follow the banquet.

Tuesday morning clinics in medicine and surgery will be conducted by some well known clinicians of the state.

An extensive didactic program covering the various specialties has been arranged.

The annual dues of $2.50 should be sent to the secretary, Dr. F. J. Hirschboeck, 600 Fidelity Bldg., Duluth, Minn.

SCOTT-CARVER COUNTY MEDICAL SOCIETY

A change in the date for the annual meeting from December to June was made at the session of the Scott-Carver County Medical Society held June 9, 1926, at Chaska, Minnesota.

Officers elected for the year 1927 are as follows: President, Dr. William F. Maertz, New Prague; vice president, Dr. E. J. Eklund, Norwood; secretary-treasurer, Dr. H. W. Reiter, Shakopee; censor for three years, Dr. C. F. Wohlrabe, Young America; delegate to State Association meeting, Dr. F. J. von Bohland, Belle Plaine; alternate, Dr. H. A. Schneider, Jordan.

Dr. B. H. Simons of Chaska, delegate to the state meeting last May, gave his report. Dr. C. Swanson of Minneapolis addressed the society on "The technic and treatment of diseases and of the commoner difficulties in obstetrics." Dr. Frederick H. K. Schaaf of Minneapolis gave an address on "Diseases of the gallbladder and diseases of the gastro-intestinal tract."

A rising vote of thanks was extended the members

of the Carver County members for the elaborate dinner and excellent entertainment furnished the members of the society.

WABASHA COUNTY MEDICAL SOCIETY

Dr. J. S. Collins of Wabasha was elected president of the Wabasha County Medical Society at the annual meeting held Thursday, July 8, at Wabasha. Other officers who will serve the coming year are: Vice president, Dr. L. F. Sutton, Mazeppa; secretary-treasurer, Dr. W. F. Wilson, Lake City; delegate to State Association meeting, Dr. W. F. Wilson, Lake City; alternate, Dr. J. A. Slocumb, Plainview; censor for three years, Dr. J. F. Bond, Wabasha.

In nominating Dr. Wilson for re-election to the office of secretary-treasurer, Dr. W. J. Cochrane of Lake City called attention to the fact that Dr. Wilson had been secretary for the past thirty years, stated that he believed he was the oldest in point of service of any component society officer in the state and called for an expression of thanks from the society in his behalf.

The afternoon session was held aboard the Mayo boat the "North Star" which Dr. Mayo had offered for the occasion of the annual meeting. The scientific program included the following papers:

Some Phases of Medical Economics—President's Address—Dr. D. S. Fleischhauer, Wabasha.

Immunization and Serum Treatment: Scarlet Fever and Diphtheria—Dr. W. P. Larson, Minneapolis, and Dr. Woodard Colby, St. Paul.

Relation of the Sanatorium to the General Practitioner—Dr. George McL. Waldie, Buena Vista Sanatorium, Wabasha.

Cod Liver Oil and Other Vitamin Containers in Infant Culture—Dr. J. T. Christison, St. Paul.

Following the boat ride down the river and return a reception for the ladies was given at the home of Dr. and Mrs. D. S. Fleischhauer.

STEARNS-BENTON MEDICAL SOCIETY

Twenty members of the Stearns-Benton Medical Society were present at the monthly meeting at Foley, June 24. A banquet was tendered by Dr. George Holdrige. The program was as follows:

Heart Arrythmias, Dr. H. B. Clark, St. Cloud.

Case report: Tuberculous Adenitis and Pericarditis in Infants, Dr. W. B. Richards, St. Cloud.

Tumors of the Breast, Dr. F. H. Stangl, St. Cloud. Cloud.

Case report: Ureteral Stricture, Dr. C. F. Brigham, St. Cloud.

Case report: Renal Calculi (in four month infant); Bilateral Pyelitis (in an eight day old infant), Dr. F. J. Schatz, of St. Cloud.

Announcement was made of the death of Dr. George Putney, Paynesville, Minnesota, who died on Tuesday, June 22, 1926. Dr. Putney was the oldest member of the Society.

OF GENERAL INTEREST

Dr. J. R. Sturre has disposed of his practice at Watkins, Minnesota, and is now located in Minneapolis. Dr. A. Shannon Fourt, formerly of Bonner's Ferry, Idaho, has purchased the Sturre Hospital at Watkins, where he assumed his duties July 1.

The Louisiana State Medical Society at its April meeting adopted a resolution disapproving the replacement of physicians as Health Officers by laymen, who in a comparatively short time has acquired the new title Doctor of Public Health (D.P.H.) The contention is that Health Officers should have the complete training of an M. D.

On June 11, 1926 "The Minnesota Society of Internal Medicine" was organized at a meeting held at The St. Paul Town and Country Club, the charter members consisting of physicians from Minneapolis, St. Paul, Duluth, and Rochester.

The purpose of the Society is "to promote among its members good fellowship, cultivate a distinct type of special practice in medicine, encourage medical education of a high order and stimulate research."

The officers are Dr. Charles Lyman Greene, president; Dr. George Douglas Head, vice-president; and Dr. Edwin L. Gardner, secretary-treasurer.

The first scientific meeting has been called for Rochester early in November 1926.

The death of Dr. Henry Stuhr, chief of staff of St. Barnabas Hospital, Minneapolis, occurred June 6, 1926, when he was killed in an automobile accident on the Jefferson highway south of Osseo, while returning from a call. An obituary notice regarding Dr. Stuhr will appear in the September number of MINNESOTA MEDICINE.

The contracts for a new hospital with a capacity of 200 beds at St. Cloud were let the week of July 19. The general contract of one million dollars was given to The Hutter Construction Company of Fond du Lac, Wisc. Other contracts totalled three hundred thousand dollars. Construction will begin August first and twenty months is allowed for completion. Sisters of St. Benedict are the builders; the architects are Smith, Gardner and Martin, Chicago.

The next examination given by the American Board of Otolaryngology will be held in Denver, Colorado, at the University Hospital on Monday, September 13, 1926. Application should be made to the Secretary, Dr. H. W. Loeb, 1402 South Grand Boulevard, St. Louis, Missouri.

Dr. R. O. Lyday, formerly of the Mayo Clinic, Rochester, is now located in Brevard, North Carolina.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of May 12, 1926

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, May 12, 1926, at 8 p. m.

The meeting was called to order by the President, Dr. H. L. Ulrich. There were 40 members present.

The minutes of the April meeting were read and approved.

Dr. Carl B. Drake (St. Paul) reported a case of Diaphragmatic Hernia, as follows:

E. C. T., age 48, married, a clergyman, was first seen at 3 p. m. August 15, 1924. At that time he was complaining of an agonizing pain over the entire abdomen most severe in the epigastrium and felt in both shoulders and arms. The pain began after lunch, and vomiting occurred with relief. There had been some stomach distress for three or four days, relieved somewhat two days previous by a dose of Sal Hepatica.

The preceding Fall he had had an attack of severe abdominal pain, fever and jaundice associated with obstinate constipation and he had been laid up several days. Except for typhoid fever in 1899 and influenza in 1921, his past history had been unimportant.

His appetite had usually been good and ordinarily he had no trouble with his bowels. His weight had been about 245 pounds for the past twenty-five years.

The patient was a large individual, evidently in great pain. Temperature 99.8°. Pulse 80. No jaundice. He was acutely tender over the upper abdomen both to the left and right of the mid-line, and pressure over the epigastrium caused pain in both shoulders. A small umbilical hernia was easily reducible. A hypodermic had to be repeated for relief.

Although he felt relieved the following morning, the patient complained of pain on deep respiration and by afternoon his temperature was 102° and he required another hypodermic.

On the third day he was taken to St. Luke's Hospital where his leucocyte count was 25,400; urine sp. gr. 1032, albumen 3 plus, many granular and hyaline casts, no acetone or diacetic acid. Blood pressure 130/88.

Vomiting continued until August 23rd, the vomitus at times being dark brown and bitter, but never fecal in odor. The stomach was washed this date and fluoroscopy showed a normally located cardia, a filling defect at the prepyloric area and a barium shadow high in the duodenal region at a higher level than the fundus. My impression was that a gastric ulcer had perforated.

By August 28th the leucocytosis had gone down to 15,000, the urine had returned to normal and the fever had been in the vicinity of 100° for several days. This date a laparotomy was performed by Dr. Harry P. Ritchie.

Upon opening the abdomen the omentum was found extensively adherent to the structures in the upper abdomen. The adhesions were separated but search failed to show any sign of stomach or duodenum.

Reaching in to the region of the fundus, the stomach could not be identified. A large, distended, thickened gallbladder, surrounded by adherent omentum was removed. Convalescence was uneventful except for a slight elevation of temperature.

A later fluoroscopy by Dr. E. Schons showed the actual state of affairs. Upon drinking the barium, the cardia was seen to fill in its normal position below the left diaphragm and the fluid was distinctly seen to return above the level of the diaphragm between the heart and spinal column in the mid-line. The antrum of the stomach, pylorus, and descending duodenum were herniated apparently through the esophageal opening.



Illustration showing filled cardia on the reader's right, heart in the center, and filled prepyloric area to the left of the heart and above the diaphragm.

The accompanying illustration is an *X*-ray taken in the diagonal position and shows the heart shadow in the center, the filled cardia to the left and the antrum to the right of the heart. Faint streaks of barium show the position of the stomach lying in the esophageal opening and the filled duodenum is visible returning through the opening in the diaphragm.

The question of attempting further operative procedure arose. It was felt that the hernia was probably congenital and the relation of the undoubted gallbladder involvement to the anomaly was uncertain. It was decided to postpone further operative procedure.

If the acute abdominal attack, as manifest by the toxic symptoms of fever, albumen and casts, was entirely of gallbladder origin, cholecystectomy would doubtless prevent furthur attacks. If due to a strangulation of the stomach and duodenum, which was spontaneously relieved, recurrence would be likely.

The patient left for his home in Arkansas a short time after recovery from the operation. A recent communication from him states that about six months later he "nearly died of an attack of intestinal flu which seemed partially to paralyze the stomach and intestines." He continued to be troubled with gas on the stomach, which clabbered milk and buttermilk relieved. He has

lived largely on this diet since last December until recently he has been able to eat almost anything but potatoes.

Diaphragmatic hernia has been much more frequently diagnosed and reported since the advent of the x-ray. In 1923, Coley states that Griffin had collected 650 reported cases, only 15 of which had been diagnosed before operation or autopsy. Knoggs reported 63 cases of hernia of the stomach, 23 of which were congenital, 21 traumatic and 12 acquired, the acquired ones being through esophageal opening. Wilkes drew attention to the existence of excessive thirst in cases of stangulation of the stomach.

Non-traumatic hernias of the diaphragm probably depend on acute or chronic increase of intra-abdominal pressure. According to Abbott, they occur through one of the so-called preformed openings of the diaphragm which are:

"1. The esophageal foramen.

"2. The foramen of Morgagni at the junction of the sternum and the seventh costal cartilage on either side.

"3. The foramen of Bochdolek posteriorly between the lumbar and costal divisions of the diaphragm.

"4. The point of entrance for the sympathetic nerve, between the external and median crura."

These hernias are much more common on the left side, and hernia through the esophageal opening is much the most common. No case of hernia through the orifices of the aorta or vena cava has been reported, according to Abbott.

Abbott believes that small hernias at the esophageal opening are more common than generally recognized. Some such cause few symptoms. Others produce epigastric pain, acid eructation of stomach contents and vomiting. They may be easily overlooked in routine x-ray stomach examinations in the erect posture. These slight hernias may be demonstrated by the patient straining in the horizontal position, being viewed in the oblique position under the fluoroscope.

The case here reported may have been acquired, the overweight having caused excessive strain on a congenitally weak esophageal opening in the diaphragm. The presence of an umbilical hernia suggests the likelihood also of a weak esophageal opening. The gallbladder thickening and omental adhesions might well have been secondary to diaphragmatic strangulation. The shoulder pain, aggravated by abdominal pressure, is a good example of referred pain through phrenic nerve irritation. The recurrence of an attack since operation, similar to the one observed, indicates that what we observed was a strangulation of the stomach and operative relief will in all probability have to be resorted to.

DISCUSSION

Dr. Zimmerman (St. Paul): A little over a year ago I took care of a case similar to the one reported by Dr. Drake. This patient, too, had also been operated upon for a gallbladder and the gallbladder removed. In spite of this operation he suffered frequent attacks of pain in the epigastrium. This pain would be relieved by taking alkalies to a slight extent. He had some of the characteristics of peptic ulcer. The x-ray revealed a picture almost identical with the picture here exhibited by Dr. Drake. The stomach was drawn up above the diaphragm into the posterior mediastinum. The bismuth meal would leave the esophagus and would turn into the posterior mediastinum and then gradually come out into the duodenum through an opening apparently in the diaphragm. A diagnosis was made of diaphragmatic hernia through the esophageal opening.

A laparotomy was made. It was found impossible to reduce the hernia and if it were possible to reduce it, it seemed impossible to close the opening. There was quite a pouch of stomach that had not herniated and to this pouch I made a posterior gastroenterostomy. This was a year ago and the man has been thoroughly comfortable ever since. I am unable to say whether his relief is due to the short circuiting of the portion of his stomach and duodenum contained in the hernial sac or whether the man actually had a duodenal ulcer in that part of his duodenum that could not be seen, and this was relieved by gastroenterostomy. In any event, he is comfortable at the end of a year.

Dr. Strachauer (Minneapolis): I have operated upon two cases of diaphragmatic hernia, one of the congenital type and the other of traumatic origin. In the second case the entire stomach, about six feet of intestine and a large quantity of omentum had herniated through the ruptured diaphragm into the thorax. Both cases were operated upon through the abdominal approach. The hernial contents were reduced, and the opening in the diaphragm closed without difficulty and really with comparative ease. The diagnosis in these cases, however, was not readily arrived at. The traumatic case followed an automobile accident, and had been x-rayed, carefully studied and treated elsewhere with a diagnosis of hemothorax. The patient's condition gradually improved, she was up and about and enjoyed a fair degree of health for a number of months. She later developed acute attacks of pain and smothering in the chest, which were considered to be cardiac in character. Auscultation of the chest, however, disclosed bubbling sounds. A gastrointestinal study showed the stomach and bowels above the diaphragm, and a correct diagnosis was finally made.

Dr. Mann (Minneapolis): These cases all illustrate the fact that the diagnosis is most important. The main point in these cases, in fact, is the diagnosis. In the past, before the war, very few of these cases were diagnosed. Most of the cases were found in the routine of an autopsy and were not suspected before death; a few were discovered during an operation for some other condition; some of them have been discovered accidentally in an x-ray of the chest for some other supposed condition; occasionally a diagnosis has been made because a gurgling sound has been heard on a careful examination of the chest, such as could come from no other organ than the bowel or the stomach.

There were so many traumatic hernias of the diaphragm during the war and the x-rays showed them so definitely that the x-ray has been used more and more extensively in obscure cases involving the chest, or in cases in which a diaphragmatic hernia might pos-

sibly be suspected, that more and more cases have been discovered in civilian practice. Gurgling in the chest and the x-ray, with the bowel containing the barium mixture showing in the chest, are both practically positive for a diagnosis.

But I wish to remind you that if gurgling is not heard, or if, in the examination of our patients, something does not attract our attention to the possibility of a diaphragmatic hernia or something abnormal in the chest so that we employ the x-ray, then we are no better off for diagnosis than they were forty years ago and the diagnosis will be missed.

As to symptoms, they vary from nothing at all to very severe ones, depending on the organs involved and the ways in which they are involved. They may vary, as to the intestinal, from mild to the more severe grade, and, as to the stomach, from mild to the more severe. There may be tachycardia from pressure on the heart. If the examination of the chest detects gurgling, your diagnosis is almost made. So, even without the x-ray, you can almost make a diagnosis if you can hear gurgling. The diagnosis with the x-ray, if propertly used, is almost absolutely sure.

As to the surgical operation, some of these cases without adhesions are not very difficult but those with adhesions of the organs in the chest or in the posterior mediastinum are exceedingly difficult, as those of us who have had such cases to deal with know full well.

Dr. Ulrich (Minneapolis): I would like to make a point regarding Dr. Drake's case and the toxemia. He thinks toxemia is due to nephritis. That may have been due to the acute obstructive symptoms of the higher portion of the bowel. Rowntree has called attention to the acute obstructive syndrome with findings in the urine resembling nephritis. If a blood chemistry had been done you might find the chlorides reduced and the urea nitrogen high. Blood tests should be done on Dr. Drake's case the next time he presents himself with acute symptoms. We recently had a case at the General Hospital of right-sided diaphragmatic hernia. The colon was involved in this case. The bowel was replaced and the hernia reduced by operating through the thorax. Gradual collapse of the lung was induced by pneumothorax and then the patient was successfully operated on through this cavity.

Dr. Chas. W. More (Eveleth) reported a case of Fracture of the Spine.

Dr. Donald C. Balfour (Rochester) read his Thesis, entitled "The Management of Peptic Ulcer."

DISCUSSION

Dr. Strachauer (Minneapolis): This is too important a paper to pass by without discussion.

It is not alone that the clinical results following the excision of gastric ulcers have been greatly improved but the importance of obtaining the lesion for microscopic examination should be emphasized. In ulcers one centimetre in diameter or larger, it is absolutely impossible to grossly ascertain the presence of benignancy or malignancy without microscopic examination. These cases should be handled like questionable tumors of the breast. Microscopic examination of the frozen section should be made immediately, and, of course, when malignancy is present a suitable type of partial gastrectomy immediately performed. It is in these cases requiring a microscopic examination for diagnosis that we are to achieve improved results in the surgery of malignancy of the stomach.

I have had cases of ulcer in children, one of the stomach in a child 11 years old, and the other of the duodeum in a child of 13, in both of which simple excision without gastroenterostomy gave entirely satisfactory results. I should be interested to learn what Dr. Balfour's experience has been in the treatment of ulcer in children.

In endeavoring to solve the problem of ulcer by operation, the surgeons have had their "fling" and periods of enthusiasm for first one operation and then another. All this has been productive of good, for as a result we have at our disposal a number of operations having definite limitations and special indications. The surgical treatment of ulcer has become one of the most satisfactory special fields in our practice. The anatomical location of the ulcer, its attachment or penetration into neighboring structures, the presence or absence of pyloric obstruction, the degree of gastric acidity, the presence of bleeding, and the phase of the ulcer—whether active or inactive—are all factors of the greatest importance and must be taken into consideration in determining the type of procedure indicated in the special case at hand.

Dr. Zimmerman (St. Paul): I am very glad to hear Dr. Balfour defend gastroenterostomy and the more conservative surgical treatment of duodenal ulcer. It is most distressing to see the tendency to do wide and mutilating operations on the stomach for apparently quite small lesions.

Dr. G. Schwyzer (Minneapolis): It is very gratifying to hear Dr. Balfour's paper this evening. The subject is so large that one does not know where to start. It occurred to me to mention a case I had years ago. The patient was first operated upon for appendicitis. A year later I diagnosed a subdiaphragmatic abscess which I successfully drained. The man was complaining considerably two years later, when I made a gastroenterostomy without any complications. The patient left the hospital a week later. After five years he came in a very desperate condition and presented a complicating peptic ulcer. He had a perforation in his stomach, a hole between the stomach, the large intestine and the small intestine. There was quite a mass to find the way through. The patient died.

I have had quite a number of perforations of peptic ulcers, especially duodenal ulcers. I discharged one of them only last week. The question of importance is: Should we do a gastroenterostomy or not, or possibly a gastrectomy? That depends on circumstances and the condition of the patient. If operation is done early enough and the condition of the patient is fair, I would think a gastroenterostomy was indicated in such a case.

I have had seven perforating ulcers, with good results. Everyone of them is living today.

A question which I would like to bring out, which is really more interesting to the internist, occurred to me through the reading of the European literature; and that is whether we treat these cases, after gastroenterostomy or gastrectomy correctly. There is a Russian, Jarotiski, Professor of Internal Medicine at the University of Moscow, who brought out the fact that the treatment of these cases is mostly incorrect. Basing his study upon physiology, he brought out the fact that any kind of diet for the ulcer which does not overcome the hyperacidity is incorrect. He condemns milk. He claims that milk has a quality of remaining too long in the stomach—when a part of the milk is given up to the duodenum, the pylorus shuts off immediately and a good deal of the milk remains in the stomach. He claims that after he had brought the acidity of the stomach to normal, all he would have to do to bring on the hyperacidity again was to give the patient more milk. His diet consists of albumen from the white of egg and non-salted butter. He claims to be able to control pains from ulcers very promptly by the mentioned diet. The first day he gives the white of one egg in the morning and in the afternoon 20 cc. of saltless butter and increases that to ten eggs a day plus 160 to 180 grams of saltless butter.

He claims if that course was followed by the surgeon after these operations, we would have better results.

Dr. H. Nippert (St. Paul): I would like to ask Dr. Balfour what is the percentage of malignancy following duodenal ulcer?

Dr Balfour (in closing): Concerning the occurrence and treatment of peptic ulcer in children, duodenal ulcer does occur in children and is often the hemorrhagic type so that in such cases there would be a preference for a local excision of the ulcer and a pholoroplasty.

As to how much of the stomach should be removed to create an achlorhydria, I prefer to do a rather limited resection; and in examining the gastric contents of a number that I had done recently I found that achlorhydria was present in all of them.

In regard to malignancy in duodenal ulcer, it is commonly supposed that this never develops in a duodenal ulcer, but instances of malignant degeneration have been reported. We believe, however, that malignancy in duodenal ulcer is very rare.

I conclusion, I think we ought to keep clearly in mind, in the management of these cases, first, the difference between gastric and duodenal ulcer. In duodenal ulcer many patients get well by doing nothing. Certainly if I had duodenal ulcer I would try and get well with non-surgical treatment. If I couldn't get well with medical treatment, I would have the most simple operation that could be performed. The most simple one is gastroenterostomy. If I did not get well on that I would have a radical operation. Most clinics report 2 per cent gastrojejunal ulcer.

As regards the after-care which Dr. Schwyzer so interestingly spoke about; it can be overdone both ways. It can be overdone by telling patients they can do anything they please. In those patients who have a great tendency to recurrence, I think you will often find there are certain things they are doing which they should not do. One of the most important points concerns smoking, and this is illustrated by the fact that when Boas has had a patient referred to him for peptic ulcer, he looks for cigarette stains on his hands and if he finds such stains he refuses to treat him.

Dr. J. G. Cross (Minneapolis) read a paper entitled "The His Bundle and Its Disturbances."

DISCUSSION

Dr. Fahr (Minneapolis): The whole history of the discovery and physiological investigation of the His system has rolled before my eyes in my own short medical career. His gave his first complete description in 1904, just before I entered Medical School. Then in 1906, Retzer had just come back from His' laboratory where he had made the first histological study of the bundle and he became my teacher in anatomy. Hering had just cut through the bundle and found that if he cut it entirely in two he got complete block. The first problem I was given to work on when I was a student at Johns Hopkins was the investigation of the nerve supply to the bundle. In 1906 Tawara made the classical investigation of the whole system from the A-V node out into the finer arborizations of the system in the subendocardial layers of both ventricles. From 1904 to 1907 the fundamental investigative work was done. With the exception of certain of the problems of etiology, the chapter is almost a closed one on anatomy and physiology; perhaps etiology is the one part not yet satisfactorily worked out.

Probably the majority of cases of temporary heart block follow rheumatic fever and other acute fevers and the more permanent cases are found associated with coronary sclerosis. And then of course there are these cases following infection which Dr. Cross described, where we don't know just what happened. Oppenheimer is probably correct in saying that the majority of permanent blocks are mostly all due to coronary disease.

We thought the opening up of this field would open an important contribution to medicine. We had this large group of hearts with no rheumatic fever and no infectious etiology, called myocarditis, and they died of heart failure. Explaining it on the pathological findings is not always satisfactory. Disturbance of conduction were thought to be of great importance for the work of the heart and might explain cases of heart failure not explained by the slight pathological findings.

Heart block apparently becomes a deleterious factor for the work of the heart only when it results in a 2:1 block; that is, reduces the ventricular rate below 50-60. Beyond that point there is about a 40 percent reduction in the work of the heart, according to Eyster's investigations. Up to that point it does not make very much difference. The arrhythmias which do interfere with the work of the heart are fibrillation, flutter, paroxysmal tachycardia, and frequent extrasystoles.

I am surprised that the men who are practicing outside of the large city hospitals see so many of these cases. Just recently I have been going to the City & County Hospital to look for heart block for teaching purposes. In two visits to the City & County Hospital, one visit to the General Hospital, and frequent visits to the University Hospital, I have only seen one case of complete heart block with Adams-Stokes' syndrome. In my experience, heart block is not common, and Adams-Stokes disease is very rare.

Dr. Gilfillan (St. Paul): These cases of course are of very great interest, and especially the pathology of them. I think during life the pathology is problematical. If we find a luetic we think it may be a gumma of the septum. I have seen some hearts with carcinoma. We do see it, however, when it is difficult to tell what the pathology is. Unfortunately these cases have a way of becoming very dear to their friends after death and I have not had many postmortems on them.

The cases I speak of especially are young people. I have a young man under observation, with ordinary slight infections, who developed a block which has kept on and on for years. This man I saw first six years ago with typical Stokes-Adams'. What is the cause in that man? What is the cause in these cases where we cannot demonstrate arteriosclerosis? We can, of course, say that one of the infections through which they have passed has caused degeneration of the septum involving the bundle, and the condition arose from that. I wonder if that is so; but I never saw one. These cases in younger people where there is no syphilis and the etiology is doubtful, I have always wondered what the etiology really was.

It does not take much to produce heart block; that is, it can be produced without any visible lesion in the bundle. Most of these cases of block are not complete all the time. The young man I spoke of would have 50 or 60 attacks a day, with a pulse of 20 or 30, and he would come out of it. The bundle has never been completely severed. It is a play between partial block and complete block; a 2 or 3 : 1 rhythm, and the coming of a complete block and the development of the Stokes-Adams' syndrome.

These cases are more common than we think because they are apt to be mistaken for something else. I remember before the days of electrocardiograph, there was a patient in the hospital and the doctor said that old man had epilepsy. His pulse was 26. I told them to take him over to my ward as I wanted to study him, and I watched him in many attacks. I got a postmortem of the heart, sent it to the University and they promptly lost it.

I recall a case I saw sometime ago. The doctor in charge called me in consultation; he thought the patient had brain tumor and slow pulse. It probably is not as uncommon as some think.

The working out of the system has come mostly in Dr. Fahr's time, but not all. We had the Purkinje fibres when I went to school.

Dr. Ulrich (Minneapolis): As to the finding of block, I think we do see more of this in private practice than in the hospitals. The terrifying and horrible part of this disease is the tendency to asystoles. It is this tendency which produces Stokes-Adams syndrome. How can we prevent asystoles in these cases? Many drugs have been used: atropin, adrealin, digitalis, amylnitrite. Recently Cohen and Levine have called attention to three cases in which they used barium chloride. From animal experimentation they have learned that calcium and barium increases the irritability of the ventricle. In their three cases they were successful with barium. We recently had a case where the ventricular rate was 18 to 26 and the auricular 54. We kept that man alive with barium chloride for three weeks, and then he failed us.

In this connection recently there has been a contribution which relates to the extrinsic nerves of the heart. In the current number of the *Journal of Clinical Investigation* (February) DeGraff and Weiss have taken 8 cases of heart block at Bellevue Hospital, testing out the action of drugs on the extrinsic nerves of the auricles and the ventricles. They have shown that there is practically no vagus control of the ventricle, and that there is richer sympathetic supply to the ventricles than the auricles. Atropinization of the vagus has the same effect on the auricular rate in heart block as it has in a normal heart. It does not affect the rate of the ventricle in the heart block. They have also tried digitalis without any perceptible change of the rates of the ventricles. Adrenalin had a distinct increase on the ventricular rate, and this was more evident after the atropinization of the vagus. In our case adrenalin and barium seemed most successful in preventing asystoles.

Dr. Gilfillan (St. Paul): The case I spoke of has had barium and went without asystoles for a considerable time.

Dr. Cross (in closing): There is very little that I care to add in discussion. As I mentioned before, it early became evident to me that a discussion of the subject of the His bundle must remain incomplete without clinical data and illustrations. I hope to add these at a future time.

The meeting adjourned.

John E. Hynes, M.D.
Secretary.

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

ROENTGEN DIAGNOSIS OF LEFT SIDED APPENDICITIS*

Leo G. Rigler, M.D., and D. W. Pollard, M.D.
Minneapolis

The clinical diagnosis of left sided appendicitis is made occasionally but usually with much hesitancy. The roentgenologic demonstration of the cecum on the left side in such a case is so convincing that the diagnosis is thus made certain. The following case report illustrates well the aid offered by the roentgen examination under such circumstances.

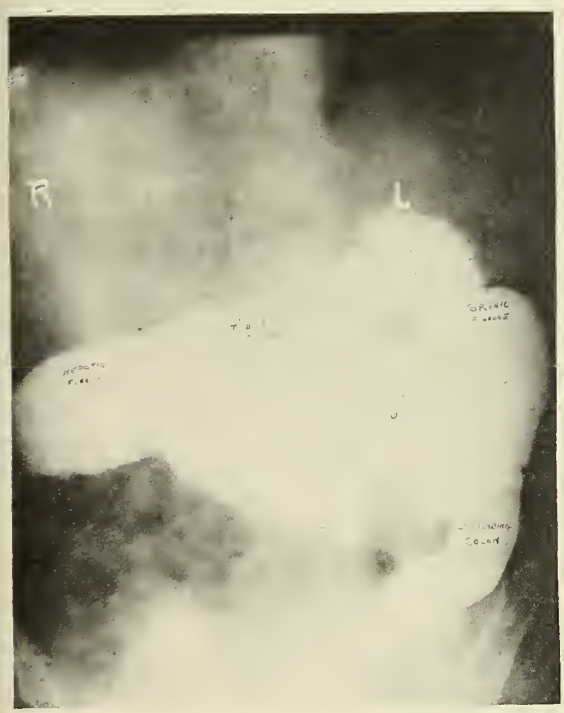


Fig. 1. Roentgenogram following barium enema. The rotation and transverse position of the ascending colon and the position of the cecum in the left upper quadrant are well shown. The contact between the cecum and descending colon and the ragged edge of the cecum should be noted.

N. J., aged 41, was admitted to the Minneapolis General Hospital complaining of severe pain on the left side. The illness had begun two nights previously with sharp pain in the left portion of the abdomen which awakened the patient. The pain was of a cutting nature and did not radiate, the point of greatest intensity being in the mid-clavicular line at the level of the umbilicus. The pain continued for 36 hours, then abated somewhat. On admission there was a constant dull ache.

There had been a similar attack about three years previously. Otherwise there was nothing of any significance in the past or present history.

The position of greatest comfort was lying on the left side with the knees drawn up. The rectal temperature was 101 F., the pulse 100. Physical examination was negative except for the abdomen. There was extreme tenderness and rigidity over the entire left side. The point of greatest tenderness was at the level of the umbilicus in the mid-clavicular line. A rather soft, immobile mass, 10 cm. in diameter was palpated. Evidence of peritoneal irritation was obtained.

The leucocyte count was 11,300. Otherwise the laboratory findings were negative.

The clinical diagnoses considered were: (1) Left-sided appendicitis; (2) renal colic; (3) intestinal obstruction; (4) diverticulitis.

A barium clystra was given under fluoroscopic control. The descending colon filled with difficulty and showed an unusual kinking in its upper portion at about the point of pain. The transverse colon was normal. The hepatic flexure was rotated so that the ascending colon was directed transversely across the abdomen, the cecum being located in the left upper quadrant in close contact with the loop in the descending colon. The cecum could not be separated from the descending colon and the point of greatest tenderness was just at the contact with the descending colon. The base of the cecum was ragged and the appendix could not be filled. The appearance suggested an appendiceal abscess with adhesions between the cecum and descending colon. The findings are shown in Figure 1.

The patient began to improve and refused operation. He was treated in another institution without surgery and at this time appears to have recovered from the acute attack.

Although not confirmed by operation, the clinical and roentgenologic findings were so characteristic that there appears to be little doubt as to the diagnosis of left-sided appendicitis.

*From the Department of Roentgenology and the Surgical "B" service of Drs. Moren and Maxeiner of the Minneapolis General Hospital.

TORSION OF THE PEDICLE OF A DERMOID CYST*

REPORT OF A CASE

Martin S. Sichel, M.D.
Minneapolis

E. M., aged 30, female, unmarried, entered the Minneapolis General Hospital on April 17, 1926, complaining of pain in the left lower quadrant of the abdomen and inability to void for eighteen hours.

Her past history was negative except for an appendectomy in 1921. She had never been pregnant, her menstrual periods being regular and the last period being on March 20th. She had missed no periods. The

*From the gynecological service, Minneapolis General Hospital, Minneapolis.

general physical examination was essentially negative except for the local abdominal and pelvic findings. There was colostrum in both breasts but no pigmentation.

On admittance a tumor was felt extending to two fingers above the umbilicus. The patient was catheterized obtaining 1200 c.c. of urine which was normal on examination. The abdominal tumor dropped to two fingers below the umbilicus. A pelvic examination was made and a diagnosis of four and one-half months pregnancy made. Her pulse and temperature were normal and leukocytes showed 14,800 count with 83 per cent polymorphonuclears on admittance.

She was observed for one week during which time she passed her urine spontaneously and normally. Toward the end of the week a temperature of 99.6° would develop daily and the patient constantly complained of pain in the left lower abdominal quadrant. At this time a mass distinct from the larger mass was outlined in the left lower quadrant which was firm, tender and about the size of an orange. A tentative diagnosis ot torsion of the pedicle of an ovarian cyst complicating pregnancy was made and it was decided to operate.

At the operation two ovarian cysts were found, the one on the right being the size of a baby's head and the one on the left the size of an orange. The large right cyst was a dermoid containing a large amount of sebaceous material and hair. The one on the left was necrotic, firm and hemorrhagic and there were two complete twists of the pedicle. The pedicle was unwound and the cyst removed. This was also a dermoid containing three teeth of adult size, sebaceous material and hair. The uterus at the time of operation was normal in size and showed no signs of being in the pregnant state. A small portion of the right ovary near the base of the pedicle was left in situ and both tubes were removed.

The patient made an uneventful recovery being discharged at the end of a fourteen day post-operative course. She menstruated normally on the third day following operation.

We may conclude from this study that the life expectancy of college graduates is somewhat higher or more favorable than that of the average young man accepted for life insurance. So far as the group of figures are reliable, for the age groups concerned, there is no evidence to indicate injuries to the health of students by athletic sports conducted under such supervision as is enforced at Yale. It would appear that men of the type who make athletic leaders are likely to expose themselves, both in war and peace, to excesses of physical injury which are escaped by their less active associates. Because of the limited numbers at the older age periods where degenerative diseases are more common, it is now proposed to continue this study to include graduates prior to 1905. (J. C. Greenway, M.D. *Yale Alumni Weekly*, June 11, 1926.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:
F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH

THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

BLOOD PRESSURE IN WOMEN AS INFLUENCED BY THE SEXUAL ORGANS: Alvarez and Zimmerman (Archives of Int. Med. May 1926). Obesity seems to influence blood pressure in women. Well proportioned women have systolic pressures that average 10 millimeters higher than those of the thin, and the stout average 12 millimeters higher than the well proportioned.

The masculine distribution of hair, sexual anesthesia, fibroids in the uterus, thyroid disease, and pelvic conditions requiring ovarectomy or hysterectomy, are associated with high average pressures. Sexually abnormal women have higher pressures than women who are sexually normal. Marked hypertension in girls sexually normal, was associated with severe nephritis.

The writers believe that essential hypertension is a bodily peculiarity inherited equally by girls and boys, but ordinarily repressed in women before the menopause or the ovarian or other related secretions. When the pelvic organs are subnormal, the disease may appear in women as early as it does in men.

F. J. Hirschboeck, M.D.

CORRELATION OF CLINICAL AND LABORATORY PROCEDURES IN TUBERCULOSIS. THE COMPLEMENT FIXATION TEST: Alexander Josewich and Floyd Grave, M.D. (U. S. Veterans' Bureau, Medical Bulletin, 1926, II, 346). The authors report the use of complement fixation tests in 750 cases at the U. S. Veterans' Bureau Hospital at Minneapolis, Minnesota. Petroff's antigen was used.

Seventy six per cent of 123 positive sputum cases gave positive fixation. Excluding nineteen cases of poor resistance there were left 104 cases of which 90 per cent gave positive fixation. Of the 270 cases giving positive complement fixation 93 per cent were positive clinically. Of 242 cases giving negative complement fixation 95.5 per cent were negative clinically. In cases in which a definite and final diagnosis of inactive pulmonary tuberculosis was given, the positive and nega-

tive fixations were quite evenly divided; the test is more apt to be negative in the event of pulmonary fibrosis. The test was more apt to be positive in the early and moderately advanced cases than in the far advanced cases with definitely poor resistance. The authors report thirty seven positive Wassermann tests in tuberculous patients with the use of the Kolmer test. Twenty three of these were negative to the tuberculosis complement fixation tests. All were clinically positive for syphilis. The cases giving both tests were fourteen in number and all but one were clinically positive for tuberculosis. Twenty seven cases diagnosed as extra-pulmonary tuberculosis were tested by the complement fixation test. Two thirds gave positive fixations which would suggest that the test is less satisfactory in extra-pulmonary cases. However, not all of the diagnoses were determined by biopsy. The authors conclude that the test should be employed as a routine procedure where a considerable number of patients are being studied and good laboratory service is available. It is usually negative in those who are acutely ill or in the terminal stage of the disease and may be negative when the disease is arrested. It is not an indicator of prognosis nor of the probable duration of the disease. Continued efforts should be made to standardize technique

A. T. Laird, M.D.

THE CLINICAL ASPECTS OF BUNDLE BRANCH BLOCK: Cowan and Bramwell (Quarterly-Journal of Medicine, Oct. 1925). This report is based on a study of twenty-four cases. Fourteen have died (ten within one year) and three others within eighteen months from the time they came under observation. Seven died of progressive heart failure with congestion, two of acute heart attacks, five from causes not directly connected with the heart. Ten patients are alive at the present time, seven are enjoying quite good health, but in only one case has there been any evidence that the lesion is tending to clear up. Twenty were men; four were women. Twenty were between 40 and 70 years of age.

The most common symptoms were shortness of breath in thirteen cases; there was anginal pain in eight; cardiac enlargement in fourteen; hypertension in eleven; associated valvular disease in eleven; auricular fibrillation in five; complete auricular ventricular block in one case.

The condition appears to be due to a secondary fibrosis of the heart muscles. Only one case showed involvement of the left branch of the coronary, showing a rather striking immunity. This was explained on an anatomical disposition and a richer blood supply.

The writers believe that it is a sign of definite myocardial disease, but if unaccompanied by signs of cardiac insufficiency is not necessarily of grave significance.

F. J. Hirschboeck, M.D.

A CAUSE OF ESSENTIAL HYPOTENSION: A. E. Fossier (Am. Jour. Med. Sc., April 1926). Fossier, of New Orleans, writes an interesting article on the cause of essential hypotension.

He states that all hypotheses heretofore advanced as to the etiology of essential hypotension have been either unproved, refuted, or found to be impracticable.

It is a condition usually found in the asthenics or splanchnoptotic, and it may be relieved by the treatment of the splanchnoptosis with abdominal support, the strengthening of the abdominal muscles and increasing the intra-abdominal fat. Organotherapy has been of no value.

It is met with in cases having an elongation of the ascending aorta and narrowing of its hemicircle, and the heart poorly supported by the diaphragm. It answers the hydraulic principles: the longer the pipe and the smaller the radius of the bend, the smaller will be the final velocity energy; or, in men, the longer the ascending aorta, the narrower the diameter of the aortic arch, the heart pressure being equal, the lower the systolic blood pressure.

This article is particularly timely and interesting.

F. J. Hirschboeck, M.D.

SURGERY

SUPERVISORS:
DONALD K. BACON,
LOWRY BLDG., ST. PAUL

VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

TECHNIC OF USE OF REMOVABLE RADON SEEDS IN CARCINOMA OF THE TONGUE: Joseph Muir (Annals of Surgery, Philadelphia, May 1926, Vol. lxxxiii, p. 598). This article describes a new technique of radium therapy in lingual carcinoma which offers a practical means of irradiating even the most inaccessible tongue lesions. This is accomplished by the implantation of removable platinum radon seeds. As the methods of treatment heretofore used have always proved unsatisfactory, this article is of especial importance from a clinical standpoint.

The various methods by which lingual carcinoma has previously been treated are discussed and their advantages and drawbacks considered. Imbedding of bare tubes according to Janeway's method affords an even distribution of radiation, but causes necrosis which is invariably followed by sloughing and may even induce unavoidable fatal hemorrhage. If screened seeds are used, necrosis is avoided, but they are objectionable because they must remain in the tongue as foreign bodies. The platinum needles advocated by Regaud also obviate necrosis and can be removed when radiation has been accomplished, but proper distribution of these applicators is very difficult; they cause too much trauma; and above all, they are hard to immobilize and cannot be placed upon the posterior dorsal surface of the tongue.

The method offered in this article obviates all these difficulties, while retaining every desirable feature. The seeds are completely screened with platinum, thus doing away with necrosis and sloughing; they are easily

withdrawn after adequate dosage has been delivered, so that they do not remain in the tissue as foreign bodies. These seeds can be placed in any position required, just as readily in the hitherto inaccessible "root" of the tongue, as in more favorable positions. The article is profusely illustrated, demonstrating the exact method of approach to these inaccessible lesions.

The growth is first carefully palpated, and the number of seeds required determined according to its depth and surface extent. When a seed has been placed in the desired position, the attached thread is left protruding from the point of entry, where it is cut off so as to leave just enough to be readily grasped with forceps at the time of removal.

The entire treatment causes no pain, and but slight inconvenience to the patient; and when skilfully performed under proper aseptic precautions, the technique offers an excellent means of solving one of the most vexing of clinical problems.

GYNECOLOGY AND OBSTETRICS

SUPERVISORS:
ARCHIBALD L. McDONALD,
LYCEUM BLDG., DULUTH

L. W. BARRY,
LOWRY BLDG., ST. PAUL

OUTLET PELVIMETRY AND ITS IMPORTANCE: C. O. McCormick (American Jol. Obstetrics and Gynecology. Vol. XI. No. 6). The author describes and illustrates the various methods of measuring the pelvic outlet. He considers the bis-ischial and posterior sagital diameters as the most important. The bis-ischial diameter extends across the anterior border of the anus and is fairly easy to measure with simple apparatus. The posterior sagital diameter is more difficult but the author describes several methods. He prefers an outlet pelvimeter described by Geo. H. Pierce.

He does not consider Roentgen ray pelvimetry of much practical value especially as regards the outlet. Outlet pelvimetry is necessary to demonstrate some of the most common types of contracted pelvis, namely the "Funnel pelvis" which represents 44 per cent of contracted pelves in white women. Without measurements, this type of deformity is usually missed till late in labor, and is the most frequent cause of outlet difficulty. It is often noted in women of muscular type with unusually large inlet measurements, and who are likely to produce stocky overweight babies.

He regards a bis-ischial transverse diameter of 8 c.m. or less as evidence of outlet contraction which indicates a narrow pelvic angle of the pubic rami instead of the usual one of 70 to 100 degrees. This forces the fetal head backwards throwing the pressure on the posterior triangle of the outlet; the perineum, levators, and pelvic fascia. If the bis-ischial diameter is less than 8 c.m., it is important to measure the posterior sagital diameter. With a narrow transverse diameter one may find compensatory increase in the posterior sagital. He quotes from Williams the requirements which are necessary to provide adequate space at the outlet.

A transv. diameter of 8 c.m. requires a post. sagital of 7.5 c.m.
A transv. diameter of 7 c.m. requires a post. sagital of 8 c. m.
A transv. diameter of 6.5 requires a post. sagital of 8.5
A transv. diameter of 6 requires a post. sagital of 9.
A transv. diameter of 5.5 requires a post. sagital of 10.

He also describes an "Index of the Outlet."

$$\frac{\text{Bis-ischial X Posterior sagital}}{11 \times 10} \cdot 2 = \text{equals index.}$$

$$\frac{2}{7 \times 10} = \text{equals 55, sufficient for normal spontaneous labor.}$$

$$\frac{2}{6 \times 9} = \text{equals 35, possible forceps.}$$

$$\frac{2}{} = \text{equals 26, usually forceps.}$$

An index below 25 is practically obstructive.

Evidence of moderate outlet contraction is an indication for lateral episiotomy, which may be extended as Schuchards incision lateral to rectum. Outlet contraction will give bad prognosis in breech extraction, will contra-indicate podalic version, and modify treatment of arrested occiput posterior or transverse position. Severe lacerations will be more frequent. The author believes that there is more practical value in outlet measurements than in those of the inlet.

A. L. McDonald, M. D., F.A.CS.

A STATISTICAL STUDY OF THE INCIDENCE AND TREATMENT OF LABOR. COMPLICATED BY CONTRACTED PELVIS IN THE OBSTETRICAL SERVICE OF THE JOHNS HOPKINS HOSPITAL FROM 1896 TO 1924: J. W. Williams and Ko Chi Sun (American Jol. Obst. and Gyn. Vol. XI, No. 6). The study includes 14,000 patients of whom 11,630 gave birth to 11,925 children who had reached a period of viability. Of the 11,630 individuals, 6,407 were white and 5,223 were black, and there were 3,100 instances of contracted pelvis, including 577 with funnel pelvis. Contracted pelves were found in 8.96 per cent of the whites, and in 37.31 per cent of the blacks.

Rickets is important as cause of pelvic deformity in the colored but is much less so in the whites.

In studying the course of labor in 476 whites and 1,766 blacks it is noted that operative delivery is much more frequent in the whites. Also that the same degree of contraction causes dystocia much oftener in the whites. The frequency of operative delivery in relation to the diagonal conjugate is as follows:

Diagonal conjugate of 8.5 c.m. opr. 100 per cent whites, 95 per cent black.
Diagonal conjugate of 9.5 c.m. opr. 90 per cent whites, 68 per cent black.
Diagonal conjugate of 10.0 c.m. opr. 80 per cent whites, 52 per cent black.
Diagonal conjugate of 10.5 c.m. opr. 43 per cent whites, 23 per cent black.
Diagonal conjugate of 11.0 c.m. opr. 23 per cent whites, 15 per cent black.
Diagonal conjugate of 11.5 c.m. opr. 18 per cent whites, 8 per cent black.

In the simple flat pelvis the frequency of operative delivery is more frequent. With a diagonal conjugate of 9.5 c.m. operative delivery was necessary in 100 per cent of the whites. The authors regard the simple flat pelvis in the white as more serious in relation to the length of the diagonal conjugate than other types of deformity. They consider that other types of contraction are more or less associated with degeneration and smaller babies.

They note a greater frequency of premature rupture of membranes, prolapse of the cord and of abnormal presentations; breech, face, and shoulder. The figures given show a progressive decrease in both maternal and fetal mortality.

The relative frequency of various types of operative delivery has undergone considerable change during the period included in the study.

	1896-1905	1905-1910	1910-1924
Low and mid forceps	13.63%	13.33%	5.54%
High forceps	15.15%	1.67%	4.08%
Version and Extraction	36.36%	25 %	9.33%
Cesarean section	22.73%	18.33%	64.43%
Pubiotomy	1.52%	40.00%	3.50%
Destructive	10.61%	1.67%	13.12%

During the first period version and extraction was most popular, during the second, Pubiotomy was done most frequently, and since 1910 cesarean section has been the operation of choice. They find that the mortality of cesarean section is relatively high following a test of labor, and particularly if there have been attempts to deliver vaginally. They prefer the classical cesarean section for elective cases, the low double flap operation following a test of labor, and the radical operation with hysterectomy in doubtfully septic cases, or to sterilize.

A. L. McDonald, M.D., F.A.C.S.

Pertussis Immunogen.—A bacterial antigen obtained by agitating live pertussis bacilli with physiological solution of sodium chloride and separating the liquid from the organisms; the extract is free or nearly free from bacterial cells and toxin. There is some evidence that this material will yield approximately the same results as the ordinary pertussis bacillus vaccine (New and Non-official Remedies, 1925, p. 354). The product is marketed in 10 c.c. vials. Parke, Davis & Co., Detroit.

PEDIATRICS

SUPERVISORS:
CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS

ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

HYPERTHYROIDISM IN CHILDREN: Robert S. Dinsmore, M. D., Cleveland, Ohio. (The third article in the Feb. number of Surgery, Gynecology and Obstetrics). The author first brings out that the incidence of hyperthyroidism in children is probably higher than would be supposed from the comparatively small number of cases which have been reported in the literature. He reports 48 cases, all occurring in children under 14 years of age.

Buford in a very exhaustive review of both foreign and American literature found only eight cases of exophthalmic goiter in children under five years of age and only eighteen cases in children under 12 years of age in a total series of 1,512 cases. In 1913, Lewis, of the Mayo Clinic, reported five patients all under 10 years of age. Cowden noted that exophthalmic goiter had not been reported in a male child under 10 years of age. In a series of 3,477 cases, Klein reports only 154 under the age of 15, and in this series the males were above 12 years of age. Bram, who has had a large experience in treating exophthalmic goiter, reports a series of forty-three patients under the age of 15, his youngest patient being just past her fifth birthday. Barrett reported one case only 2½ years of age. White reported a case of congenital Graves' disease, and Klaus, in 1914, reported the presence of hyperthyroidism in an infant of 9 months.

In the author's series of forty-eight patients, one patient was 5½ years old; one 7; two were 8 years of age; two 9; three 10; four 11; three 12; thirteen 13; and seventeen, 14 years of age. Among the males six were 14 and two were 11 years of age.

As far as etiology is concerned, heredity seems to play an important part. Climenko reported a series of cases in one family in which the mother, two daughters, and a child of each of the daughters, one a boy and the other a girl, had the disease. The mothers of eight of their patients had had goiters, and in at least two instances hyperthyroidism had also been present.

He concludes as follows:

1. Hyperthyroidism in children is perhaps more common than has been supposed and reported cases will undoubtedly appear more frequent in the future.

2. The etiology is unknown. A small percentage of the cases reported in the literature and also in this series, followed acute infection, but ordinarily there is no tangible factor to which the disease can be attributed. The onset is abrupt and the clinical course rapid. Induced hyperthyroidism may follow the prophylactic use of iodine in a small percentage of cases

but this can usually be controlled by the discontinuance of the iodin.

3. These children react quite unfavorably to all kinds of operative procedure and must be handled with extreme care.

4. In the presence of other foci of infection, the goiter should be removed first, the other foci of infection being removed after the patient has recovered from the thyroidectomy.

M. G. Gillespie, M.D.

ULTRA-VIOLET RAY THERAPY IN TUBERCULOSIS OF CHILDREN—A RETROSPECT: Joseph H. Marcus, M.D., (Arch. of Ped., June, 1926). It is too frequently forgotten that sunlight contains besides heat and light, other forms of radiative energy very beneficial to the most hopeful forms of growth. The chemical rays of light increase the basal metabolism; stimulate cell activity; increase the cell content of blood; heighten the calcium and phosphorus contents of the blood; and possess certain phagocytic characteristics.

Regarding the influence of the ray upon the metabolic rate and blood chemistry, Denman had much experience and its effects are just as positive and almost as prompt as hypodermic medication. It penetrates the skin and enters the capillary circulation exciting positive chemical reactions in the blood.

Exposures given 3 times a week are quite satisfactory. In the author's experience from one to three months are necessary to arrest a case of pulmonary tuberculosis, depending upon the severity of the case.

Of the glandular forms, the mesenteric was most rapidly improved, next, the mediastinal, and last, the peripheral. Pulmonary tuberculosis of the miliary type remained uninfluenced by ultra-violet ray therapy even though it was begun early in the course of the disease.

Wright maintains that all forms of tuberculosis except pulmonary and meningeal are greatly improved by ultra-violet ray therapy. He contraindicates its use in active pulmonary tuberculosis and in tuberculous meningitis; bone and skin tuberculous adenitis and peritonitis, and pleurisy with effusion are among the forms most successfully treated, stressing the importance of fresh air, as an adjunct of the treatment.

Professor Axel Reyn, medical superintendent of the Finsen Institute, Copenhagen, in discussing the treatment of tuberculosis by artificial light, stated that 96 out of 114 patients suffering from lupus were cured, and the proportion of permanent cures was 90 per cent.

McKenzie has had satisfactory results with quartz light therapy in the treatment of lupus and local tuberculous conditions, such as tuberculosis of the knees, glands, hips and anal abscesses, tubular in origin.

Both Gauvain and Martin stress with unusual emphasis the great importance of heliotherapy in the treatment of surgical tuberculosis.

The ultra-violet light ray is of definite value for relief of symptoms in intestinal tuberculosis.

The author states that strikingly clinical results have been obtained by the aid of actinotherapy, the conditions so treated being rickets, spasmophilia, eczema (light therapy, as an adjunct) and peribronchial adenitis, secondary to measles, pertussis, influenza and pneumonia.

Ultra-violet ray therapy, while not specific, is the most valuable recent contribution to the treatment of certain types of tuberculosis, and should not be used as a distinct and separate entity.

It is the duty of the physician to educate the people to the new knowledge of sunlight, both natural and artificial, as a means of health, teaching, that it is a stimulant, a tonic and nature's universal disinfectant.

R. N. Andrews, M.D.

EYE, EAR, NOSE AND THROAT

SUPERVISORS:
VIRGIL J. SCHWARTZ,
PHYS. & SURG. BLDG., MINNEAPOLIS

E. L. ARMSTRONG,
FIDELITY BLDG., DULUTH

CYANOSIS RETINÆ IN ERYTHROMELALGIA: F. Phinizy Calhoun, M.D., Jackson Birthday Volume. Retinal cyanosis, previously noted in congenital heart disease and in polycythemia vera, is now found in a case of vasomotor disturbance of the extremities. This condition (erythromelalgia) is a chronic disease in which there are pain, redness and heat of one or more parts, usually extremities, and these manifestations are aggravated if the parts hang down, as in the erect posture. There are thought to be changes in the anterior or posterior horns of the gray matter in the cervical and lumbar parts of the spinal cord; toxemias or infections may also be factors.

As a peripheral neuritis involving the vasomotor nerves it may be associated with angioneurotic edema and Raynaud's disease. Marked compensatory changes have been found in the intima of vessels leading to the diseased area, with consequent narrowing of the lumen. These are the results of a previous long-standing distention of vasomotor paralysis of these vessels.

The author's patient complained of sharp pains, redness, itching and burning of feet, then both hands, then gluteal regions, these evidences being more marked on standing.

The blood pictures over two years showed a high percentage of hemoglobin (102-110 Dare), a high red-cell count (about 6,000,000), 12,000 to 24,000 leucocytes with polymorphonuclear increase, and later a few myeloblasts and nucleated red cells—altogether not a polycythemia vera.

There were no subjective eye disturbances, and none objectively except for the retinas, which were alike in the two eyes.

The fundus generally was a deep, brick-dust red. The temporal disc-margins were clear but the nasal were blurred, suggesting mild edema. There was great increase in the size, number and tortuosity of the retinal vessels, especially the veins. The arteries were darker

and larger than normal, and the light streak was abnormally prominent; capillaries also were enlarged and tortuous.

The veins were tremendously dilated, purplish-black, not unlike a mass of worms, with great ectasiæ which seemed about to break, but no hemorrhages were ever seen. The engorgement increased on changing *from the erect to the recumbent position,* so that the only plausible explanation seems to be *a venous and arterial stasis within relaxed vessel walls due to a vasomotor constrictor paralysis.* The mild nerve edema may be due to increased blood viscosity, which would favor stasis within the nerve, which would in turn compress the neural part of the vein and so impair the retinal return circulation. This, then, might enhance the venous dilatation and tortuosity.

VIRGIL J. SCHWARTZ, M.D.

ON THE SIMULTANEOUS AND SUDDEN OCCURRENCE OF UNILATERAL BLINDNESS AND CEREBRAL LESION: Harry Friederwald, M.D., Baltimore, Maryland, Jackson Birthday Volume. The usual cause of sudden unilateral blindness in persons of advanced age is thrombosis of the central retinal artery. The presence of optic atrophy, of marked changes in the retinal arteries, and of general vascular disease are indices to the nature of the condition. When a thrombosis occurs at the same time in the central retinal and one or more of the cerebral arteries, particularly the middle, there will be added to the blindness a number of other symptoms.

In thrombosis there is a diseased vessel wall with a narrowed lumen, through which, however, sufficient circulation to insure a functioning retina may continue for a considerable period, when, suddenly, blindness sets in. This is caused either (1) by total occlusion of the lumen, through thickening of the inner layers of the wall or spasm of the muscle layer, or (2) by failure of a lowered blood pressure to propel the blood through the constricted channel.

The first of three illustrative cases had had a systolic blood pressure ranging from 200 to 240 over some time, with headache and weakness; then a momentary loss of vision of both eyes, which recurred a day later, followed in a few days by an attack which left the left eye amaurotic. There was a left optic atrophy, and marked arterial narrowing with arterio venous compression in both eyes. There was complete loss of half the left visual field, so a diagnosis was made of simultaneous thrombosis of the left central artery and of the right occipital hemisphere.

The second patient, about 55 years of age, suffered with "doubled" vision of the left eye and blindness of the right. This came suddenly with vomiting, dizziness and unconsciousness. Except for a high hyperopia the left eye was negative; the right eye, however, showed marked optic atrophy and arteries of very irregular caliber. Arteriosclerosis with chronic nephritis and a fibrillating heart were found.

The age, arteriosclerosis, the fundus picture in each case point definitely toward a central artery thrombosis as the cause of the sudden blindness; temporary complete blindness, as in the former case, is occasionally seen in cortical hemianopsia. The apoplectic cerebral symptoms point toward a co-existent cerebral thrombosis.

A third case had had an attack of sudden mental cloudiness, paralysis of the right arm and leg, aphasia, and blindness of the left eye. There was marked left optic atrophy with greatly contracted vessels, as in embolism of the central artery. Since there was no general arteriosclerosis and no pathology in the vessels of the right eye, there was probably present here not a thrombosis but either an embolism or cerebral hemorrhages.

VIRGIL J. SCHWARTZ, M.D.

ON THE INTRACRANIAL EXTENSION OF OPTIC NERVE TUMORS: Arnold Knapp, New York. (Jackson Birthday Volume). Primary optic nerve tumors which seem confined to the orbit may often extend into the cranial cavity. Byers and Hudson found forty cases out of a hundred ninety-one to present intracranial involvement. Twenty-one out of twenty-three postmortem examinations of diagnosed cases showed an intracranial tumor, but never a local (orbital) recurrence. Extension took place into the intracranial part of the affected nerve, the chiasm, the opposite nerve and the brain. Cases of optic nerve tumor have been observed for twenty-four years after operation without signs of intracranial involvement. Gliomas may be of varying malignancy—some slowly progressive, other rapid.

The x-ray may be used by Rhese's method, to see whether or not the optic canal and foramen are enlarged by a tumor. Measurements may be thus made for comparing the right and left sides.

The author reports four cases of glioma ranging from 4 to 52 years of age operated by him within a few years using the Krönlein method. Three of these cases showed a complete or developing secondary optic atrophy in the involved eye, with little or no remaining vision in this eye, and *a very definite enlargement of the optic canal of the corresponding orbit.* The fourth case is entirely free from orbital or intracranial symptoms after eleven years, and there is no enlargement of the optic canal nor of the pituitary fossa.

Treatment is very difficult; of course, while localized in the orbit, removal of the tumor is indicated; but when intracranial extension shows itself, gliomata are practically inoperable.

VIRGIL J. SCHWARTZ, M.D.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

AMERICAN RELIEF ADMINISTRATION BULLETIN. Series 2, No. 45, April 1926. American Medical and Sanitary Relief in the Russian Famine, 1921-1923. With chapters on Russian Medical Practice, Epidemics, Deficiency Diseases and Famine Manifestations. Henry Beeuwkes, M.D., Medical Director, American Relief Administration, Russian Unit. 128 pages. 101 illus. 9 charts. New York: American Relief Administration, 42 Broadway, 1926.

HAY FEVER AND ASTHMA. A practical Handbook for Hay Fever and asthma patients. Ray M. Balyeat, A.M., M.D., Instructor in Medicine, University of Oklahoma, etc. 198 pages. 27 illus. Cloth, $2.00. Philadelphia: F. A. Davis Company, 1926.

THE PRINCIPLES AND PRACTICE OF ENDOCRINE MEDICINE, William Nathanial Berkeley, Ph.D., M.D., Recently Attending Physician at the Good Samaritan Dispensary, New York. Cloth. Price $4.50. Pp. 368, with 60 illustrations. Philadelphia: Lea & Febiger, 1926.

This book covers, briefly and yet thoroughly, the entire field of endocrinology. Only the known facts are included, and all speculation, if discussed at all, is given only short consideration. Each gland is taken up individually, and its anatomy, physiology, and pathology is considered. There is a chapter on the inter-relation between the different glands and one on pluriglandular disease. The book is interestingly written, and one that is well worth the busy practitioner's time.

A. N. BESSESEN, JR., M.D.

CONCEALED TUBERCULOSIS OR THE TIRED SICKNESS. George Douglas Head, M.D. 137 pages. Illus. Cloth, $2.00. Philadelphia: P. Blakiston's Son & Co., 1924.

This text describes a type of sick person which has given concern to almost every practitioner of medicine. Dr. Head's description and discussion indicate not only broad experience, but also keen analysis and discernment.

He divides the symptoms into four groups, with reference to the predominating complaint: (1) chest pain, (2) nervous exhaustion, (3) cold and cough, (4) abdominal distress.

The value and also the limitations of physical examinations are brought out. In differential diagnosis, the more common conditions which may be confused are discussed, such as syphilis, myocarditis, gastric and duodenal ulcer and hyperthyroidism.

There is a short chapter on management; also considerable space is given over to case histories.

This book is written in the comfortable easy style so characteristic of the author and deserves a place in every physician's library. L. R. CRITCHFIELD, M.D.

WANTED—Salaried appointments for Class A physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

WANTED—Pediatrician and oculist and aurist to become associated in a Minneapolis clinic. Address C-82, care MINNESOTA MEDICINE.

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RURAL OBSTETRICS AND A COMPARATIVE STUDY OF ITS RELATION TO PUERPERAL MORTALITY STATISTICS.*

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While the subject under discussion is not a new one, it must be admitted that until the high rate of maternal and infant mortality is reduced to zero, the subject of obstetrics is to be an ever present one. In spite of numerous laudable advances in medicine and surgery we cannot point with pride to any recent notable advance in obstetrics. Rural obstetrics has long been regarded as "poor obstetrics." It is not my object to offer an apology for the obstetrical work of the rural practitioner, but rather to offer a partial defense. Nor do I present this subject for the purpose of controversy or criticism of elaborate methods employed by others today. That there exist undiscovered causes of the maternal mortality rate, I believe will become clear to us as we study the mortality statistics of the United States Census Bureau. There is always food for thought in statistics, especially so when they reveal unsuspected conditions (Chart I).

Comment on Chart I.—This chart presents to us the "Death rates from Puerperal Causes for the year 1924" (not printed to date.)† It shows representative states of the forty states that now comprise the registration area and gives us the puerperal status by states, comparing urban and rural population. Please note that the first column of figures under each division gives the percentages for the cities and the second for the rural status. As we study the chart we note that the rural status shows a better record in every instance than that given for the urban. This is not only true for the states that I have chosen for this chart but it holds good for all of the forty states in the registration area. Nor are these figures true only for the year 1924, but note the comment by the Chief Statistician at the foot of the chart. This gives us a rather complete and accurate status of the puerperal state in our entire nation, divided into the urban and rural populations. That there must be some definite causes for the difference in the urban and rural status is evident. Let us bear this chart in mind and later draw some conclusions as to the possible causes.

Rural obstetrics does recognize certain definite handicaps that are not so readily overcome as some of our "ardent idealists" would have us believe. It is a fact that idealism in obstetrics is often far removed from conditions in actual experience. Briefly our handicaps are economic, educational, and lack of adequate help.

The Economic Problem.—It is a notorious fact that the average obstetrical fee in rural practice is far from a paying proposition. We perhaps will find that $15 to $18 is the common fee, and in addition a large number thrown in as charity. If the rural physician were able to obtain a fee of $75, he could afford to give a complete service and take care of a minor number at a reduced rate and others as charity. Again, where operative interference becomes necessary and a compensatory fee is permissible we usually receive at best but a small increase in the usual fee. The economic condition of the average country family —and it usually is a family growing in numbers —does not permit of a fee of $75 nor of $50. Hence we have an effect on the amount of service rendered by the physician. Not a careless and indifferent service but one of necessity limited.

The Educational Factor.—There is a wide lack of education in the rural districts as to the care and needs of the expectant mother. So long as our state recognizes midwives as furnishing ample aid to the expectant mother it will

*Read before the annual meeting of the Minnesota State Medical Association, Saint Paul, May 17 to 19, 1926.
†Provisional in minor details.

be difficult for the general practictioner, or for the medical profession at large, to drive home the "Appreciation of the Arts of Obstetrics." We in the country contend with the laity's "Disappreciation of the Arts of Obstetrics." Is it not true that Mrs. So-and-So comes in and takes care of this and that case—and everything goes well? What is more, she charges only $3 to $5. We are glad that agencies are at work to educate the mothers of the rural districts in obstetrics and infants' care. How much the Sheppard-Towner Act has accomplished is another question. I have seen no signs of its activity, but assume that in some places work has been done. The county nurse and the wide-awake physician are producing considerably more results. Thus far, however, we are facing conditions far from ideal.

Lack of Adequate Help.—Usually the physician and the husband are present alone with the wife to be confined. In perhaps 40 per cent of the cases some neighbor's wife or relative is present. Rarely do we have a nurse or someone equal to the skill of a practical nurse. All cases outside of the exceptional emergency cases are thus taken care of. In a severe emergency one may be fortunate to have the aid of some neighboring physician rushed out to lend his assistance. What a contrast to the help available in a large city hospital! Even if the case can be taken to a small local hospital skilled help is still lacking. Then again as to the question of the immediate care of the mother during the puerperium—usually it is the neighbor's wife that comes in once daily to bathe the baby and look after the mother. This often happens for three to five days, when the mother takes care of herself and the infant. You may well smile and shake your head when you think of asepsis and antisepsis. Yet with all this inadequate help, with no asepsis or antisepsis, with crowding of quarters, with no facilities of toilet, etc.—a picture often of utter despair and horror—one must concede that the babies and mothers thrive well. I believe that we far underestimate the natural defense that nature has provided in obstetrics. It is not so often the simple care that causes our high mortality in childbirth as it is the meddlesome care. Strange as it may seem, these handicaps do not seem to have a direct ratio to the maternal death rate. Nevertheless, these handicaps are not fancies. We meet with them weekly. They are our big experience. Often they furnish thrill enough to make us shake in our boots. As much as we dislike to work under such conditions, we nevertheless are working under them. It is, then, no wonder that our confrères of the cities and the teaching staff do not understand rural obstetrics. We lack the bare major essentials and cannot entertain the fine points of technic nor begin to have the general facilities in the home.

We were instructed in school by our professors that to properly take care of an obstetric case we should make the same careful preparation as the surgeon does for a major operation. How near this ideal is approached by the rural physician will somewhat depend on the personal equation, but as a rule it cannot be carried out because of the unfavorable conditions he has to meet. We must therefore adapt ourselves to these unfavorable conditions and work out a plan by which we can give a reasonably successful obstetrical service. We must have a simple yet safe and efficient method, a method that fits into the economic problem of our clientele, a method that is educative and looks forward to a better day in rural obstetrics, and a method that copes with the lack of adequate and inefficient help.

I wish to offer my method of procedure based on an experience of twelve years of rural practice in which I have attended more than 1,100 cases of confinements. I believe the test of any method, in the final analysis, rests upon the results obtained.

Wherever possible—and with a certain degree of enforcement—get the expectant mother to visit you in your office. Get the data as to date of confinement. If a multipara find out if there were difficulties in previous labors; if so, make a careful pelvic examination. If a primipara, obtain the external pelvic measurements. In all cases take the blood pressure and make a urine examination. The latter should be repeated at intervals of a month if the case presents itself early in pregnancy. Make an examination of the position of the fetus. Inquire into the mother's general health and give proper advice. The collected data should be written down in her presence; it makes a better impression. Every opportunity for pre-natal care and instruction should be utilized. Explain the advantages of hospital confinement—especially if a primipara.

Keep the supplies in the obstetrical bag complete. Sterile gauze, cotton, umbilical tape, su-

CHART I.

Death Rates from Puerperal Causes Per 100,000 Population: 1924 In the Registration Area by States, Cities (10,000) and Rural Districts

	The Puerperal State		Accidents of Pregnancy		Hemorrhage		Other Accidents of labor		Septicemia	
	C.	R.	C.	R.	C.	R.	C.	R.	C.	R.
STATES										
ALL STATES 40	17.3	13.5	1.7	1.1	1.7	1.4	1.7	1.6	7.0	4.4
CALIFORNIA	14.1	11.8	2.0	1.4	1.4	1.0	1.2	1.5	4.8	3.9
COLORADO	21.1	14.8	2.6	1.8	0.3	1.4	1.8	1.0	10.9	6.0
IDAHO	36.9	11.1	4.9	1.4	2.6	2.3	4.9	0.9	22.1	3.4
ILLINOIS	14.3	9.2	1.6	0.7	1.6	1.0	1.2	0.7	6.2	4.0
INDIANA	15.4	11.1	1.8	0.8	1.7	0.8	1.0	0.8	7.4	4.9
KANSAS	19.2	11.1	2.4	0.8	1.1	1.5	2.6	0.9	7.8	3.3
MAINE	31.0	14.7	4.8	1.1	3.1	2.0	5.2	3.1	8.7	3.1
MASSACHUSETTS	16.4	6.2	1.3	0.6	1.6	0.3	2.5	0.3	5.5	1.9
MINNESOTA	14.0	9.3	0.4	0.7	1.0	0.8	1.6	1.4	6.9	3.3
NEBRASKA	21.4	12.0	2.3	1.1	1.6	1.2	2.3	1.4	9.6	4.5
NEW YORK	13.9	7.4	1.3	1.0	1.8	0.7	1.7	0.8	5.2	2.7
OHIO	16.5	9.6	1.8	1.0	1.6	1.0	1.6	1.0	7.0	3.5
WISCONSIN	16.0	11.1	1.2	1.0	1.9	1.3	1.6	1.3	6.2	3.4
WYOMING	42.4	20.1	3.0	2.2	6.1	1.6	3.0	3.3	15.1	7.1
VIRGINIA W.	16.2	11.9	1.2	0.8	0.9	1.1	0.9	1.4	8.8	3.7
VIRGINIA C.	33.7	25.4	2.0	2.0	3.4	2.6	3.4	3.6	9.8	8.1
SOUTH CAROLINA W.	38.5	18.1	1.7	2.1	1.7	2.0	3.7	5.7	17.0	5.8
SOUTH CAROLINA C.	61.3	35.1	8.2	2.9	5.4	2.6	2.6	2.5	12.2	4 .6
MISSISSIPPI W.	34.2	14.8	5.9	1.2	5.9	2.1	2.4	0.9	9.4	4.2
MISSISSIPPI C.	51.4	27.5	1.7	1.4	6.6	1.6	9.9	3.7	14.9	8.9
LOUISIANA W.	22.9	14.4	2.9	1.5	2.6	1.7	1.8	1.4	8.6	4.3
LOUISIANA C.	50.5	30.4	3.2	1.3	4.5	1.5	2.6	5.2	19.8	9.6

"Special attention is called to the fact that for both white and colored for each of the six years 1918-1923, rates from all puerperal causes and puerperal septicemia are, without exception, lower for the rural part of the birth registration area than for the urban."

WILLIAM H. DAVIS, M. D.
Chief Statistician.

ture material, anesthetic, ergot and pituitrin are apt to run out and to be found missing when most needed. A good kelly-pad kept clean and instruments free from rust form part of the equipment. When the call comes respond at once. After arriving "set your table." I use clean newspapers on which I set all of my necessary equipment. Sterilize gloves and instruments. Make an antiseptic solution. For this I use Izal (Abbott's). It is more potent then lysol and can be used in hard as well as soft water. Make a vaginal examination after a

simple proper sponging of the vulva. I do not believe in scrubbing and sponging these parts as if you were paid by the hour—nor do I believe it necessary to paint with strong solutions such as alcohol and iodine. Satisfy yourself as to the condition of the cervix, bag of waters, and position of the presenting part. Next make an external examination and with it locate the baby's heart tones. Definitely to hear the fetal heart tones is not easy in all cases—and it may later come in very helpful to know where to find them in case labor should become difficult. Inform the mother as to the progress and set her at rest. It is here where good judgment, a lot of patience, and the "ever watchful expectancy" and one might add "armed expectancy" will count markedly in reducing the maternal and infant mortality rate. After you have satisfied yourself that the case has all the aspects and findings of a normal termination don't interfere with its progress. In a sense you have done the most important part of the confinement in satisfying yourself from the examination that the case will terminate normally. In case you have a less favorable condition and especially where a definite indication for interference exists, you should act early to be ready for all the emergencies that may confront you. It is still important for you to wait for nature to correct the difficulty—but be ready to interfere at once if necessary.

I believe in a small dose of pituitrin shortly before the end of the second stage of labor. The only time that I do not use it is when the labor pains are exceptionally strong and severe. Pituitrin prevents hemorrhage and permits you to give a better anesthetic in that you are not apt to lose the labor pains under the anesthetic. I use chloroform for an anesthetic. I have never had a bad hemorrhage after using pituitrin at this stage. You can safely go about taking care of the baby. The interval between the second and third stages of labor can thus be well utilized in cleaning the baby, tying the cord, and treating the eyes. You will also note if it has any deformities. You are then ready after an interval of ten to twenty minutes to deliver the placenta. I do not hesitate to use in a mild form the Crede method and usually there is no difficulty. If there is trouble have patience to wait. Examine for tears and if there are any, repair at once. Place an abdominal binder about the mother, clean up and pack up. Once more see if there is any undue bleeding, take the pulse, and give instructions for mother and baby. I always leave a dozen or more ergotin tablets to be taken one four times daily. If the economic condition of the case permits, I make a post-partum call. I, however, make a post-partum call in case labor had some abnormal course.

How well has this method succeeded? (Chart II).

Comment on Chart II.—This chart presents to you a table of figures based on a questionnaire that I submitted to fellow practitioners in the rural districts. I sent out fifty letters and had a reply from twenty-nine. Thirty-five of these were sent out to men who have been in practice for a considerable number of years. Fifteen were sent out to men in practice only a short time. My returns from the latter were so few that I have not charted any of them. I, however, did have a good reply from the older men. You will note the questions asked at the head of each column.

Conclusions from this chart leave no doubt in our minds that the physicians who have done years of obstetric work in the rural districts have done it well. Some of these records are enviable. They bear out the record of the chart that I first showed you. I believe these men would all agree that they have fallen far short of the standards set them to do good obstetrics; not that they were willfully negligent to use a major surgical preparation but that it often was impossible. One other conclusion seems to appear, that where it has been impossible to follow an elaborate preparation and technic they have relied upon the one resourceful factor of non-interference in the course of labor. In conversation with some of these men this seemed to be their strongest point in conducting so successful an obstetric practice. The record under cesarean section especially stands out in support of a non-operative intervention method.

In a report of an investigation of the causes of the 984 maternal deaths occurring in Massachusetts in 1922 and 1923 made by the Massachusetts Department of Public Health the following quotation is significant:

1. "Septicemia, toxemia and hemorrhage causes, generally preventable, were responsible for 58 per cent of the deaths."

2. "A clear impression was gained, however, by our physicians, during the course of this study,

CHART II.

Replies to A Questionnaire Sent to Rural Practitioners On Puerperal and Obstetric Cases

Years in practice	No. of cases	All deaths	Infections	Eclampsia	Placenta praevia	Placenta retained	Cesarian	Gloves %	Vaginal Exam. %	Rectal Exam. %
36	3000	2	1	5	7	3	0	10	100	0
16	1200	1	0	6	1	12	0	100	95	5
25	2500	6	0	30	6	0	0	100	90	10
25	1500	6	12	5	2	0	0	100	100	0
21	1300	0	0	3	0	5	2	10	100	0
26	1200	1	0	4	2	15	2	50	100	0
40	3000	?	12	20	20	0	0	100	100	0
38	600	1	0	5	1	0	0	0	100	0
35	500	1	0	14	0	0	12	10	90	10
41	3000	5	3	5	6	0	0	0	100	0
19	1200	4	10	4	7	3	4	100	100	0
32	2500	3	2	3	3	2	0	100	90	0
21	500	1	1	1	3	0	1	100	95	5
17	650	0	1	1	1	2	0	0	100	0
23	2000	0	0	2	2	1	0	50	100	0
49	5000	?	100%	25	25	0	10	100	100	0
48	1500	19	10	12	3	1	0	100	80	0
20	1000	2	6	7	2	2	4	100	20	80
21	2400	5	2	15	10	0	30	100	100	0
16	480	0	0	0	1	0	0	100	98	2
20	1200	35	0	35	15	2	3	100	100	0
25	2500	2	1	8	6	0	4	100	100	0
30½	2000	3	2	5	5	0	2	1	99	0
33	660	3	10	12	6	5	3	80	30	70
12	1140	2	0	5	0	0	0	100	100	0
TOTAL	42,390	102	173	232	139	53	66			
Average	1697+	4+	7—	9.3	5.5	2.3	2.7			

Note—Author's record at the foot of the table.

that many thoughtful general practitioners have come to the conclusion that this factor of *operative intervention is of considerable importance in the total of unfavorable results,* even after making allowance for the cases inevitably operative from the beginning. In 591 of our series of 984 cases, operative procedures figured."

3. "Lack of adequate prenatal care was evident in 89 per cent of the cases." (However, 52

per cent had less than three months of so-called prenatal care.)

4. "Poverty as a cause of maternal mortality did not stand out in this series of causes." (From table 7. "Midwives evidently did not play an important part in this series of deaths—22.")

A later communication as to rural status gave the following:

"Eighteen deaths (1.8 per cent) occurred in towns of less than 2,500 population."

"Twenty-nine mothers (2.9 per cent) had lived in towns of less than 2,500 population, but died in larger towns, most of whom were delivered in hospitals."

In the study of this report we have a very fruitful if not significant suggestion as to one of the causes of the unfavorable maternal death rate. It will have to be granted that it is considerably more difficult for the rural practitioner to resort to operative intervention in his work than the practitioners in larger centers with hospital facilities. Under No. 4 we note their conclusion again that neither "poverty nor midwives played an important part in this series of deaths." A study of these statements connected with the findings of the rural and urban status of Chart I leads us to a question that should be considered by our profession at large—namely, *does the puerperal death rate rest partly on the convenience of facilities for operative intervention?* And *if so, is that an explanation of the ratio of deaths between the urban and rural status?*

In an address before the Interstate Post-Graduate Assembly in St. Paul last year, Dr. DeLee gave the following five most common errors in obstetrics that show up most frequently in mortality and morbidity statistics:

1. "Failure to make a complete diagnosis.

2. "Lack of knowledge or failure to practice the real principles of asepsis.

3. "Ignorance of the course of occiput posterior positions.

4. *"Operating before the complete dilatation of the cervix is present.*

5. "A disappreciation of the pathologic dignity of the arts of obstetrics which leads to downright neglect of the woman in labor."

This opinion is based on a study, partly, of the mortality and morbidity statistics as we had them in Chart I. I believe it would be safe to state that the rural practitioner might be guilty to a greater degree of the first three errors given than the city practitioner. As to the fourth error, however, I believe the reverse is true. This would coincide with our previous conclusion. There is considerable food for thought in the study of these statistics and these suggestions. Minor factors exist that bear upon the ratio of the various causes of maternal deaths. I believe it is clear, however, that there must be some definite outstanding cause for the constant variance between the urban and the rural ratio in the puerperal death rate.

CONCLUSIONS

1. Educate all expectant mothers to place themselves under your care early.

2. Make a careful physical examination and especially a careful pelvic examination in primiparæ and also in multiparæ that have had previous difficulty in labor.

3. Give general advice as to rest, food, elimination, etc.

4. Keep your hands free from infection in your daily practice.

5. Exercise patience.

6. Have a sure and rigid but a simple aseptic and antiseptic technic.

7. Use a small dose of pituitrin at the end of the second stage of labor and ergotin postpartum.

8. Recognize the importance of obstetrics. It is not necessary to make the dignity overbearing, nor is it necessary to garnish it with a multiplicity of frills and accessories. They are unessential. Use a simple method—but be on the job.

L'OREAL HENNE

The A. M. A. Chemical Laboratory found the hair dye L'Oreal Henné (F. L. Lebeau, Inc., New York City) to consist of two packages: one containing a white powder, the other a yellow substance. The white powder responded to tests for sodium perborate. The yellow substance was apparently composed of iron and copper salts with pyrogallol and vegetable matter. (Jour. A. M. A., July 10, 1926, p. 118.)

MATERNAL MORBIDITY AND THE GENERAL PRACTITIONER*

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Statistics show that maternal mortality in this country is not being materially reduced. All papers on obstetrics necessarily deal directly or indirectly with this situation.

Papers by the general practitioner are useful chiefly as they show the difficulties he has to contend with and make it apparent wherein his functioning as an obstetrician (so long as he has to act in that capacity) can be improved.

The general practitioner has little advice to give but he may have opinions as to the quality and sufficiency of such advice as is tendered him.

The hope for better obstetrics lies in encouraging an individual sense of dissatisfaction with other than optimal results through care of the mother before, during and after labor.

The man who practices in the hospital has his patients under close observation. The outside man may possibly be unaware that there is any need for improvement. He may regard his mortality as nil or entirely accidental, while his morbidity is hidden from him by the lack of a well-kept temperature chart and routine postpartum examinations.

The rural practitioner, who is compelled at present to do much obstetrical work, is, in the country at large, according to investigations made last year, some fifty-four years of age and was graduated some twenty-nine years ago. (The figures for Minnesota are lower.) He necessarily has the weak and strong points of that time of life. He has attended some 1,000 labors and has his opinion as to how they should be conducted.

In the last thirty years opinion has changed regarding the use of rubber gloves, of the mask, the treatment of inevitable abortion, the use of pituitary extract, the use of chloroform anesthesia, methods of analgesia, prenatal care and hospitalization. Hardly any general practitioner will be found in accord with the generally accepted opinion on each and every one of these subjects. To him at the half-century mark new material needs to be presented in a manner to appeal to his judgment, reasoned out and detailed.

The subject of obstetrics labors under the disadvantage of not being a suitable one for repeated clinical demonstration. No matter how carefully some modification of an operative procedure is described, men will seek an ocular demonstration before making use of it. This is not feasible in obstetrics. Hence the need of carefully detailed descriptions.

To reach the general practitioner these descriptions must be published in those journals to which he subscribes—the journals published in the state and the Journal of the American Medical Association.

Do the published papers to which the general practitioner has ready access meet his needs? This viewpoint will be kept in mind in this paper.

Many excellent and notably practical papers have been published locally by Adair, Bessesen, Condit, La Vake, Litzenberg, Mussey, Rasmussen, Randall, Simons and others.

The Medical Society of the State of Massachusetts in an attempt to meet the situation in that state invokes the memory of Oliver Wendell Holmes, a former president of its society, who eighty years ago called attention to the contagiousness of puerperal fever, and formally asks the support of the profession for the purpose of reducing maternal mortality. At intervals the section on obstetrics publishes in the state journal the number of deaths in the puerperal condition with comment on the percentage in the preventable classes and with practical instruction in the elements of routine obstetrics. Is not that society right when it enters into the details of diagnostic and therapeutic technic more minutely than is usually done in the papers we generally get from obstetrical experts who seem too often to write as one expert to another and to be afraid of hurting anyone's feelings by descending to minute details where details are the essence of the instruction? This attitude may be very flattering to the general practitioner but is not conducive to better obstetrics.

*Read before the annual meeting of the Minnesota State Medical Association, Saint Paul, May 17 to 19, 1926.

ANTEPARTUM CARE

All observers agree that maternal mortality and morbidity can be reduced when adequate care has been given to the pregnant woman. Antepartum supervision fits in well with the general practice of medicine. The subject has recently received considerable attention in our journals. A list, which may well be kept on hand for reference, should include the following suggestive items: abnormal weight increase, possible pyelitis, vaginal bleeding, restriction of automobile riding, early periodical irritability of the uterus, restriction of sexual intercourse, restriction of fatiguing work, anemia, care of the skin, intertrigo in the stout, misconceptions and fears on the part of the patient, notification by the patient of unusual symptoms. The patient should be seen routinely once a month the first six months, twice a month the last three. Polak states that increased blood pressure antedates albuminuria by days and weeks. He has noted that a short forearm and short middle finger and an unusually shaped lumbo-sacral rhomboid suggest an unusually shaped pelvic outlet.

A late study of 984 maternal deaths in Massachusetts shows that, in 89 per cent of the cases, there was a lack of adequate antepartum care.

LABOR

In the lying-in room there should be a distinct and conscious stepping-up of the quality of the service to be rendered, that we may not merit the reproach of DeLee, who says three of the five most comomn errors in obstetric practice are: failure to complete one's diagnosis, failure to practice real asepsis and downright neglect of the patient. He was speaking of hospital practice.

On the way to the call, the practitioner may well run over in his mind any sources of contagion he may recently have come in contact with. He will reflect whether or no a mask is needed.

A well-warmed room will usually take the place of the aseptic drapings of the hospital, a critical inspection of the fuel container being to him of more importance than that of the linen closet. A roll of aseptic absorbent cotton, the ends protected by the manufacturer's wrappings, provides a continuous source of aseptic sponges for all usual purposes other than for repair work. A portable device takes the place of the delivery room bed.

To help meet rural conditions it is here suggested that two pair of rubber gloves, intact and sterilized, be filled with a reliable antiseptic solution; that both pairs be worn at the same time, to the end that, on the removal of the outer glove at the last moment, a sterile inner glove may be available for any vaginal interference. If the gloves are to remain on, the solution remaining within the inner pair may be diluted with sterile water. When not upon the hands the gloves should be kept sunken in a reliable antiseptic solution by a plate in a circular vessel with sloping sides.

The rubber glove was introduced into obstetric work about 1900, after the graduation of many men now in active practice. The first reaction to the suggestion of rubber gloves in obstetrical examination was a look askance at the grievous proposal to blind the diagnostic eye at the end of the finger with a rubber film. Some will remember the noted surgeon who prided himself on the sharpened finger-nail with which he claimed to rupture the amniotic sac. Had he lived he would certainly have resisted the innovation for a time! Doubtless convincing proof of the life-saving benefit of rubber gloves was published at the time but not sufficiently widely to reach all.

Little has been published lately about rectal examinations. The lateral position with the back of the patient towards the examiner is here suggested as presenting the advantage of keeping the thumb away from the vulva. Some quick pieces of information are obtainable but one doubts if massaging the os uteri with a part of the vaginal wall is an aseptic procedure and whether reliance upon this method does not sometimes induce a pusillanimous hesitation to enter the vagina or the uterus when the situation demands it.

The three following items from our journals provoke thought concerning unnecessary manipulations:

Dipper, an observer in Peking, China, reports a great increase in puerperal fever in the last two decades and finds that, with the scientific obstetrics of today *imperfectly exemplified,* the Chinese mother is less safe than twenty years ago when no examinations of the os were made by native obstetricians.

In an investigation of 984 maternal deaths in Massachusetts it was found that 592 were associated with operative intervention and, in the opinion of many general practitioners, this operative intervention contributed to increase the total of unfavorable results, even after making allowance for cases inevitably operative from the beginning.

A Minnesota general practitioner has shown that 1,000 unselected cases have been delivered with the use of forceps in but four instances—a percentage of 0.4. Most of us would have to admit a percentage twenty or thirty times as great.

ANTISEPTICS

With the swing of the pendulum we hear again of intravaginal antisepsis, of massaging the walls of the vagina with a dram of 4 per cent mercurochrome solution an hour before any vaginal interference. DeLee, who uses the preliminary scrub and cleanup method with excellent results, is thinking of combining with it the iodin or perhaps the mercurochrome preparation.

The subject of antiseptics in labor is a live one for the general practitioner. He would like to hear some laboratory man on the whole subject. It is quite certain that some sepsis is incurred by faulty use of antiseptics. If we are depending on unreliable antiseptics, on ineffective strengths of reliable antiseptics, if we are allowing too little time for effective strengths of reliable antiseptics to work, if we are asking the impossible from any antiseptic, we should be informed in detail of our possible mistakes and any erroneous notions should be exploded.

NEW PROCEDURES

As an illustration of the difficulty of getting complete descriptions of new procedures, the synergistic rectal ether analgesia is here selected. In order to try out the method a first time successfully and with due appreciation of every detail the account given by Gwathmey and Hooper last fall in St. Paul with their latest formulæ was collated with the preceding accounts by A. B. Davis and Randall and the subsequent one by an Australian observer. The pieced-out description follows:

When the cervix is two fingers dilated, the pains coming three to five minutes apart and lasting thirty or more seconds and with the patient complaining of pain, give intramuscularly (not hypodermically), deeply (for complete and rapid absorption and to prevent sloughing), in the gluteal region (not in the outer side of the thigh), with a long needle (not with the ordinary short hypodermic needle), and during active pain:

Morphine Sulphate	⅛ grain
Novocain	¾ grain
Sterile 50% solution of chemically pure Magnesium Sulphate	2 c.c.

Twenty minutes to two hours later, according to the degree of relief obtained, repeat the injection. Randall, speaking of the injection without novocain, notes that the injections give a reasonably comfortable first stage, and, more important, a relaxation of the cervical tissues, which materially assists dilatation. Davis states that if the injections are given towards the end of labor, with sedative effect, delivery often takes place before there is any indication for the ether instillation. Gwathmey then gives the following rectal instillation:

Quinine Hydrobromide	gr. 20
Alcohol	dr. 3
Ether	oz. 2.5
Olive Oil q. s. ad	oz. 4
or	
Quin. Alkaloid	gr. 20
Alcohol	m. 45
Ether	oz. 2.5
Olive Oil q. s.	oz. 4
or heavy liquid petrolatum.	

The druggist can put this up, being cautioned to use ether for anesthesia.

Give, if necessary, an additional intramuscular injection of the 50% magnesium sulphate with novocain but without morphine.

If labor is prolonged beyond four hours repeat the whole program, Davis noting that subsequent instillations of ether should never be given at less than 2½ hour intervals and always with only 10 grains of quinine.

The Australian observer adds the following details: The administration requires: a 150 c.c. funnel, 50 cm. of rubber tubing, one glass

connection, one soft rubber catheter, size 20 French.

Before these injections are commenced the patient should have two or three enemata to clear the pelvic colon.

During the analgesia the patient is maintained in quiet surroundings, cotton wool is inserted in the ears and a bandage is applied over the eyes to reduce external stimuli. Manipulations are reduced to a minimum.

The patient is placed in Sim's position for the instillation and the anal region is smeared with vaseline to prevent excoriation. The catheter is passed in about 20 cm. (8 inches) to clear the fetal head. Air is excluded from the rubber tube, after which olive oil is run in and immediately followed by the mixture, this being gently milked in between the pains and then the patient is asked to "squeeze up" the sphincter so as to produce retroperistalsis. The catheter is next withdrawn and pressure is maintained during three or four contractions by a pad against the anus.

Davis gives some additional precautions: The patient must be watched while asleep, as she may turn from side to side and fall out of bed. Make every effort to have the instillation retained, by telling the patient to coöperate by keeping the mouth open during the next few pains, by telling the patient she will get relief if the instillation is retained, by leaving the clamped catheter in the rectum for ten or fifteen minutes, by making no vaginal or rectal examinations for at least one hour after instillation. He gives as little ether by inhalation as possible at time of delivery. He notes that colitis, true diabetes and auditory disturbances are the only contraindications to this method.

Harrar tells us that he is convinced that rectal ether analgesia is the safest and most effective method for the relief of pains of childbirth over a period of hours that has so far been devised, its applicability being much greater than that of scopolamin amnesia, and that it can be safely and effectively used by the physician in home confinements. It is proper to add that the Australian observer, quoted above, does not agree with this. He considers it a hospital procedure and states that it has the disadvantage also of not always being effective and here the disadvantage is felt so much because it is very dangerous to give a general anesthetic to the recipient of these gluteal and rectal injections. DeLee uses the method in selected cases with satisfaction.

PITUITARY EXTRACT

While a minority of us has consistently fought shy of pituitary extract in the second stage of labor, probably a large majority does so use it, taking the precaution of using it in small doses and the same firm's output. If this practice ought to be discontinued, much cogent argument will have to be broadcast.

J. Whitbridge Williams, in a special article, says he has practically abandoned its use in the second stage and resorts to operative delivery instead, but uses it in the third stage after expulsion of the placenta, following it with ergot, which takes effect about the time the pituitary extract begins to weaken.

Rucker shows that pituitary extract never gives periods of rest between contractions but always a continuous series of contractions with increase of intrauterine pressure.

The Handbook of Therapy (1920) advises the hypodermic use of ergot as soon as the head is born and says pituitary extract may be used cautiously.

THIRD STAGE

The third stage of labor has received adequate mention in our journals along the line laid down by Polak in his classical article published in 1915. The picture of the placenta springing off at its central portion, with blood then acting as a wedge to separate more and more of it until the more firmly attached circumference is reached, if not interfered with by manipulations, should appeal to every practitioner's judgment.

FOURTH STAGE

The postpartum conservation of the mother's blood has been emphasized of late in our journals. An article by Harper in 1923 is in the same class as Polak's in that it goes into the cause of abnormal loss of blood and its prevention by the management of each labor from its beginning, in not allowing the uterus to become tired out. He also points out that bleed-

ing does not "come on" suddenly but that in all cases bleeding has been continuous from the beginning of this stage, being concealed, if not open, showing itself by increase in size of the uterus.

Burgess' method of attacking postpartum hemorrhage from an atonic uterus is endorsed by DeLee as suitable for home confinements. Burgess places his left hand well up on the abdomen and by rapid pressure downwards expels all blood from the uterus and vagina. Immediately this is done he takes a sterile towel—set aside for the emergency—in his right hand and crowds it against the perineum, closing the vulvar orifice, and by pressure from above and from below checks all bleeding. He does not massage the uterus but maintains firm pressure. He then is in position to direct the elevation of the foot of the bed, the bandaging of the legs, the giving of ergot and pituitrin, and the giving of salines by rectum if not subcutaneously or intravenously.

IMMEDIATE REPAIR

The failure of the textbooks to adequately describe and illustrate immediate repair work has not been met by recent articles so far as this search shows.

The instructions issued on leaving a confinement case must be explicit and suited to the intelligence of the attendant and the resources at hand. In this connection one may be permitted to express a doubt of the advisability of using even an originally aseptic perineal pad, tied down as it usually is, if the nurse is efficient, and shifting accurately up and down over the anal region.

It has not been sufficiently emphasized that our duties as obstetricians do not really end until our patient has regained her usual health.

In conclusion a general practitioner would appeal for the continuance of the practical papers we have been having in our local journals in some cases detailing the minutiæ of new procedures and in others bringing uppermost the rationale of the advice given.

Classical papers like Polak's and articles recording the consensus of opinion of experts on matters that have been under discussion might well find a depositary in the Handbook of Therapy of the American Medical Association.

THE POSTPARTUM REPAIR OF OBSTETRICAL INJURIES.*

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It has come to my observation that within the last few years the number of patients who consult me for conditions in the pelvis and the pelvic floor, which are directly due to obstetrical injuries, is becoming very markedly decreased. However, I believe the percentage of patients now having post-obstetrical complications can still be lessened to a considerable extent. For that reason I am prompted to write this paper on the postpartum repair and correction of pelvic injuries.

Lacerations of the cervix uteri can, in practically all cases, be ascribed to: (1) the application of forceps before the cervix has slipped over the head; (2) the performance of a version before the cervix is completely dilated; (3) the use of pituitrin in the first stage of labor; (4) severe contractions of the uterus, forcing the head through the cervix before dilatation is complete; and (5) wilful incision of the cervix by the obstetrician, sometimes indicated in rigid cervix or eclampsia.

Lacerations of the pelvic floor may be due to: (1) the proper or improper application of forceps; (2) version; (3) percipitate labor, either spontaneous or from the use of pituitrin; or (4) a normal labor in which disproportion between the size of the head and the pelvic outlet is present. Lacerations of the pelvic floor are always discouraging to the attending obstetrician. Still I believe that 75 per cent of all primiparas, delivered spontaneously and with due care, will receive somewhere within the birth-canal a laceration of some degree.

The application of the high forceps is almost certain to cause laceration somewhere in the birth-canal and is apt to be quite high up in the vaginal wall, where the damage may be great due to lacerations of the urogenital fascia. The danger of mid-forceps is not as great as that of the high forceps but still

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greater than the low forceps in which the head is simply slipped over the perineum.

The performance of an episiotomy, when it seems reasonably certain that a laceration is going to occur, is in my opinion perfectly justifiable. Personally, I prefer a central episiotomy for the reason that the repair afterwards is more easily accomplished and one can use in the repair a procedure such as would be used in a secondary operation.

Realizing the fact that lacerations of the perineum and the cervix are in a large majority of the cases excusable, I plead today for the repair of any and all lacerations immediately postpartum.

If any of the conditions that are likely to produce a laceration of the cervix are present, I believe the cervix should be fully investigated to ascertain whether it has been lacerated or not. This is easily accomplished by the use of two pairs of tenaculums or a sponge forceps, pulling the cervix down and inspecting its entire circumference. Lacerations, as we know, are usually bilateral and can be determined quite easily; when determined, they should be stitched with a twenty-day chromic catgut continuous suture. The danger of infection if done under proper surgical procedure is nil.

Regarding lacerations of the birth-canal, it is is imperative that the lacerations be looked for. I feel quite certain from my own experience and the observation of others that many lacerations of the vaginal wall are entirely missed in the postpartum inspection. One should not look only at the perineum and give it a casual glance, but should go over the entire vaginal wall—anterior, posterior and lateral—using the gloved hands to separate the parts and visualize the field. I feel quite certain that many tears of the lateral anterior vaginal wall are missed. There are also tears of the lateral vaginal wall which do not appear nor connect up with the perineal tear; these are present usually after forceps delivery but may be after a normal spontaneous delivery as well. If found, they should be stitched with continuous chromic catgut. Lacerations of the perineum, whether or not they involve the levator ani muscles, should be stitched with chromic catgut, following the procedure of a secondary repair on the perineum, namely, widely separating the laceration; introducing interrupted chromic catgut sutures, finding the muscle if torn and bringing it together; proximating the hymen fringe; then stitching the posterior vaginal wall with interrupted or continuous chromic catgut; then inserting chromic catgut in a running suture, incorporating the fascia covering the levator ani muscles and then returning subcuticular, so that your catgut as far as the perineum is concerned is all subcuticular. This in my hands has been a very satisfactory method in the repair of perineal lacerations.

I will grant you that many have had good results by the use of silkworm-gut, but I do believe that better results can be obtained by treating these cases as if you were doing a secondary repair of the perineum, individualizing your muscles, your fascia and your skin. For this reason I believe the central episiotomy offers more satisfactory results than the lateral one. If an episiotomy has not been done, the rough, uneven and jagged portions of the vagina should be excised so as to make the wound as smooth looking as possible.

The mere fact that one stitches these parts in approximation as they were before being lacerated does not tell the entire story. Procedure must be carried on as if one was doing a real surgical operation; there should be a complete re-application of sterile towels and dressings to the perineum, and even sometimes a change of gloves. The work must be carried on so as to avoid any contamination whatsoever.

The final restoration of the vaginal parts is aided a great deal by the general condition of our patients. A patient who has been in labor for many hours and who has become extremely exhausted is not apt to get as primary and rapid a union as one who is more vigorous and has not been exhausted. The patient who is very anemic, or who has had a postpartum hemorrhage, is not apt to heal as rapidly or well nor be as free from sepsis as one whose blood count is not low. This then reverts back to other things concerning the conduct of pregnancy which have decided beneficial effects upon the convalescence of labor, i.e. the proper prenatal care of patients. Proper prenatal care as regards the presence of albumin, the presence of anemia, etc., will aid a great deal in the quick and prompt repair and re-

storation of the pelvic parts. The conduct of labor itself has a great deal to do with this question; the proper use of morphine and hyoscine during the first stages of labor so that the patient does not become too exhausted before the cervix is fully dilated; and the use of ether, chloroform or gas during the second stage conserves your patient, and its use is strongly recommended. I believe that if your patient is in the second stage of labor for two hours without delivery, it is time to put her to sleep and find out what is the matter and then correct the condition found or deliver manually.

Restoration of the uterus to its proper position is very important in the proper convalescence of the obstetrical patient and the early assumption of the knee-chest position is of value. By the postpartum examination, one can make certain of the position of the uterus and if it is not correct a pessary should be inserted to hold the uterus in good position. These methods aid greatly in the convalescence of our patients and the proper restoration of the pelvic parts.

My plea is that postpartum patients should have proper restoration of the pelvic parts, with proper suturing; should be conserved as much as possible during the course of labor; should be examined repeatedly if necessary postpartum so as to ascertain the condition of the pelvis.

SHOE DYES AND ANILINE POISONING

Serious poisoning with the now widely used shoe dyes is by no means of uncommon occurrence. The toxic ingredient is the solvent of the pigment and appears to have been either nitrobenzene or aniline. The shoe dyes containing aniline are relatively inoffensive in odor, and for this reason are the more insidious, though less toxic than preparations containing nitrobenzene. The Chicago department of health will require that all shoe dyes bear a warning of their danger. (Jour. A. M. A., July 3, 1926, p. 34.)

METHENAMINE

Methenamine is the name now used in the new U. S. P. X. for the substance described in the old pharmacopeia as hexamethylenamine; it is a more convenient contraction of the scientific name hexamethylenetetramine. (Jour. A. M. A., July 3, 1926, p. 51.)

ECTOPIC GESTATION*

DEFINITION, CLASSIFICATION AND A CONSIDERATION OF THE SYMPTOMS, DIAGNOSIS, AND TREATMENT

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The plea is often made that ectopic gestation is a rare condition, so rare that the general practitioner may never meet with a case and thus needs to know little about it further than to know that there is such a condition and that it leads to serve internal hemorrhage occasionally.

Before beginning the general consideration of ectopic gestation I wish to establish the importance of my subject by the quotation of a few statistics. The following figures are a résumé of the statistical literature on the subject by A. B. Spalding. He found that of 2,955 women observed with pelvic disturbance there were thirteen ectopic pregnancies or one in 227. In this same series of cases he found one ectopic in 131 pregnancies and of 86 patients curetted for possible abortion and bleeding, thirteen, or 17 per cent, were suffering from ectopic gestation. In other words, over 17 per cent of the women subjected to the dangers of curettage were so jeopardized because of failure to recognize the true nature of the condition present. This in itself is truly serious, not mentioning the added and even more grave prognosis due to the pregnancy itself being unrecognized. Schauta reports a mortality of 30 per cent and Veit a mortality of 25-28 per cent in recognized cases. I am sure we need go no farther to show that the condition is serious and one deserving greater consideration and closer study.

Ectopic gestation is the term applied to the condition in which pregnancy occurs anywhere outside the uterine cavity. Various names have been applied. The term extra-uterine is quite widely used but is not satisfactory, since it implies pregnancy outside the uterus and excludes cases where the ovum is implanted in the interstitial portion of the tube. Thus the more accurate, most applicable, and most satisfactory term is ectopic gestation or ectopic pregnancy.

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Keeping in mind the anatomical relations, one can readily see the various possibilities of location upon which classification is based. As might well be expected, on this as on all other subjects there are diverse and extreme views. Tait, at one extreme, believes that every ectopic gestation is originally tubal, while Hausmann, at the other extreme, believes that most ectopic pregnancies are ovarian. The fallacy of the latter's views are readily seen. Tait, however, is very persistent and his views were generally accepted until quite recently when cases of primary abdominal pregnancy, established as such beyond all reasonable doubt, have been reported by such careful observers as Galabin, Hirst and Knipe, Witthauer; and cases of primary ovarian pregnancy have been reported and insisted upon by such men as Sweeny, Young and Shea, and others. This much is certain, that the vast majority of ectopic pregnancies are tubal primarily, many of which may rupture and become implanted elsewhere, secondarily, and that primary abdominal and ovarian gestations, while comparatively rare, occur perhaps more frequently than is generally supposed.

After reviewing the literature I feel that the following classification is thoroughly justifiable:

1. Tubal.
   - A. In free portion of tube.
     1. Primary throughout.
     2. With rupture maintaining original placental site.
        - a. Into broad ligament,
        - b. Into peritoneal cavity.
     3. With rupture and secondary implantation of the placenta elsewhere.
   - B. In the ampulla.
     1. Primary throughout.
     2. With rupture maintaining original placental site.
        - a. Into broad ligament.
        - b. Into peritoneal cavity.
     3. With rupture and secondary implantation of placenta elsewhere.
   - C. At the fimbriated end.
     1. Simple.
     2. Tubo-ovarian involving ovary secondarily.
   - D. Interstitial.
2. Ovarian.
   - A. Primary implantation.
   - B. Secondary implantation.
3. Abdominal.
   - A. Primary implantation.
   - B. Secondary implantation.

This classification is self-explanatory. However, the primary tubal, ovarian, and abdominal pregnancies must fulfill special conditions to differentiate them from the other forms. In primary tubal pregnancy one or more coats of the tube must completely surround the tumor in recognizable form. The conditions to be fulfilled in primary ovarian pregnancy are well stated by Speizelberg:

1. An intact tube on the affected side.
2. A fetal sac occupying the position of the ovary.
3. Connection of the sac to the uterus by the ovarian ligaments.
4. A sac wall containing ovarian tissue in several places.

Jacobson adds to these the following:

1. The fetus visible in the cavity of the ovary.
2. Demonstrable connection between the fetus and the ovary.

Primary abdominal pregnancy must fulfill the following conditions:

1. Tubes, ovaries and broad ligament normal except when the ovum is attached externally.
2. No penetration of the intraligamentary spaces from ovarian fimbria.
3. No intraligamentary rupture of the tube.
4. No escape of ovum from uterine cavity.
5. Proof that the peritoneum forms the reflexa of the ovum.

With these points of definite differentiation before us and with the present day opportunities for gross and microscopic study at operation or autopsy, authentic cases reported by careful observers can scarcely be questioned. Thus it would seem that the above classification, based, not on any one man's experiences, but on the conservative and authentic reports of many observers with careful and thorough technic, should be thoroughly acceptable.

One of the puzzling and most peculiar facts regarding ectopic pregnancy is the universally observed fact that it gives rise to so many normal signs and symptoms of pregnancy and so extremely few and inconsistant abnormal signs and symptoms. This in itself makes the diagnosis extremely difficult. But in addition to this the multiplicity of locations and complications makes the problem of diagnosis doubly hard. The essential

condition in diagnosis is that the condition is recognized early in order that the mother may be relieved of the danger of serious terminations later.

For the sake of convenience and to avoid confusion the diagnosis will be considered under three heads: (1) Diagnosis before rupture; (2) Diagnosis at rupture; and (3) Diagnosis after rupture.

In regard to diagnosis before rupture the question may well be asked, "Is it possible?" In order that this may be done, two conditions must be proved: first, the fact of pregnancy, and second, its location outside the uterine cavity. This, of course, must be done in all cases, but the real difficulty presents itself before rupture. We may grant at once that in the greater percentage of cases this is impossible and principally for three reasons: First, we rarely get an opportunity because the patient does not apply for advice until rupture has occurred and more serious symptoms have followed; second, the menses go on and the fact of pregnancy is likely to be overlooked entirely; third, the whole history is apt to be misleading because of complications or lack of symptoms. The majority of patients have no suspicion of anything whatever being wrong until suddenly and without warning rupture occurs.

When a case does present itself for diagnosis we must first establish the fact of pregnancy. This we know is impossible with absolute certainty until the fourth or fifth month when the fetal heart sounds become audible and fetal movements evident. Since primary rupture always occurs before the fourteenth week, absolute diagnosis of pregnancy is impossible before rupture. However, with the other signs of pregnancy, excluding the absolute signs, a reasonably certain diagnosis can be made. Hegar's sign, the Abderhalden test, with the general and local changes due to pregnancy and a suspicion on the part of the patient, together with disturbed menses, all converge to make the diagnosis quite certain. Yet, it must be kept in mind that the chances of error are great before the fetal heart sounds are audible.

Granted the diagnosis of pregnancy, we must now determine its location outside the uterine cavity. This is by no means an easy matter since all the usual plastic and sympathetic changes present in normal gestations are also present in ectopic and few or no other changes or symptoms are demonstrable. In addition to the normal signs of pregnancy, history of prolonged sterility, of salpingitis, abnormal menses, bloody flow, and one or two skipped periods with resumed flow and shreds of tissue and the patient feeling different from other pregnancies all lend a grave suspicion. Pain is quite a constant symptom. Sharp, lancinating, paroxysmal pain, which is due to repeated small hemorrhages caused by the constant eroding of villi or distension of the parts due to growth, unilateral and referred to the ovarian region, is indeed very suggestive. On palpation the determination of a distended tube, on the affected side, or other mass showing elasticity, tenderness, mobility, and fusiformity, is quite characteristic but must be differentiated from hydrosalpinx, hematosalpinx, pyosalpinx, retroverted pregnant uterus, pelvic abscess or exudate, uterine tumor, and thin walled ovarian and parovarian cysts. Differentiation from pyosalpinx, retroverted pregnant uterus, pelvic abscess or exudate and uterine tumors is comparatively simple by mere palpation. Two negative conditions are of importance in early diagnosis: (1) No elevation of temperature, and (2) exclusion of uterine pregnancy. In abnormal pregnancies the cervix soon becomes open and remains so. Failure of diagnosis is often due to not keeping the possibility of an ectopic pregnancy in mind and the exclusion of pregnancy on the flimsy evidence of lack of amenorrhea. This much must be said, however, that the diagnosis is not easy previous to rupture but that in a large percentage of cases it should be made Especially now that we are rapidly arriving at the state of education of the public when a call to the physician's office is no longer looked upon with such great disfavor by the expectant mother.

Considering the difficulties of the diagnosis of ectopic pregnancy itself, it is readily evident that the diagnosis of the type of ectopic pregnancy is nigh unto impossible in any case.

Rupture of the gestation sac may occur in two general ways: (1) Intraperitoneal, serious and often fatal; (2) extraperitoneal, into the broad ligament (always tubal). Lathrop, who has recently made exhaustive studies of the condition, says that diagnosis seems to depend more on the severity of the symptoms at rupture than on the grouping of symptoms. When rupture occurs with severe loss of blood leading to profound anemia the diagnosis is much more suggestive

than if rupture occurs with slight loss, in which case spontaneous recovery may take place. The character of the pain, while excruciating, is not always unlike that of other acute abdominal conditions, namely, an ovarian cyst with a twisted pedicle, gonorrheal salpingitis, hematosalpinx ruptured ovarian hematoma and ruptured varicosed veins of the broad ligament; but the fact of the pain being sudden, excruciating and paroxysmal, with blanching of the patient and evidence of shock, is valuable evidence in the presence of a vaginal discharge and a history of pregnancy. The typical history of attack is that the patient was suddenly seized with severe pain, causing her to fall to the floor in a state of collapse. If rupture occurs with severe hemorrhage, pelvic examination is of little value. There is no mass to be felt and while the blood is fluid there is little bogginess in the cul-de-sac. Both Ladinske and Lathrop feel that the diagnosis in ruptured ectopic pregnancy is far more accurate than in most other cases of surgical interference in the abdomen.

In a few cases pain and hemorrhage are absent, in which case the pregnancy may go on to term. These however are extremely rare. In fourteen of Lathrop's cases vaginal bleeding was the first symptom and pain had not occurred at the time of operation. There was pelvic tenderness but no pain. In fifteen of his cases there was pain but no uterine hemorrhage; in one case, history of flowing beginning at regular period but no pain, while in fifty-three cases there was a fairly typical history of skipped menses, signs of pregnancy, pain, vaginal discharge, and signs of hemorrhage and shock. While the typical signs are not always present, yet the symptoms are usually severe enough to excite grave suspicion, and the history and careful observation and examination will usually verify the suspected condition. In Lathrop's series of cases the percentage of those in collapse was small, below 10 per cent. The severity of the attack is not necessarily proportional to the amount of hemorrhage. Severe shock often results from a slight hemorrhage into a preëxisting cavity presumably due to the sudden increased pressure. This fact has been definitely proved by many observers but satisfactorily explained by none. Again, shock and collapse do not necessarily mean ruptured ectopic pregnancy as might be inferred.

Other conditions as ruptured ovarian hematoma also give shock and exsanguination. However, careful observation and interpretation of the other conditions present will readily differentiate.

Rupture into the broad ligament is not so clear a case. The hemorrhage is confined and less profuse and the symptoms less marked. Such a case may go on to term. However, with a history of pregnancy, palpation of a tumor in the broad ligament, resumed menses with passage of decidua in part or as a uterine cast with no evidence of true abortion, the diagnosis is considerably simplified.

Should we for any reason fail to see the case until the first symptoms of rupture have disappeared and the patient has more or less completely recovered from the shock, our diagnosis is more direct. Usually a tumor forms at the back or side of the uterus with a variety of symptoms, chiefly those of a foreign body in the peritoneal cavity or the broad ligament. If the former, signs of local or general peritonitis may appear with a distended intestine walling it off above. The tumor may displace the uterus forward and crowd the bladder and rectum. Pain, hemorrhage and shock may recur from time to time with increased size of the tumor, or fatal syncope may intervene.

Rupture into the broad ligament gives less marked after-symptoms and peritonitis is usually absent. Diagnosis at this time is usually plain. With a history such as one should be able to elicit and evidence of growing tumor and exsanguination the condition can scarcely be confounded with anything else. The fetus may continue to grow after rupture with the same placental site or secondary attachment. Several such cases have been reported; two by Lathrop. The fetal sac finally ruptures and the fetus dies. Rarely does a case come to maturity and allow the delivery of a live mature child by abdominal section. I was able to find but two such authentically reported cases. The dead fetus, if small, may be absorbed, leaving no evidences; or it may become encysted and either remaining as a lithopedion may be carried for a greater or less length of time before being detected, or by suppuration may be discharged into the bladder, vagina or rectum. Wallace reports a case of a lithopedion being carried for twenty-six years, during which time four normal pregnancies ensued without

complication. Mooney reports one case of his own in which the fetus had undergone suppuration and had discharged through the bladder and at operation a humerus was found perforating one wall of the bladder with the protruding end coated with urate deposits. He also reviews a similar case of another observer. Diagnosis of this later condition is usually made by eliciting a complete history; or, at operation, by finding evidence of fetal parts. A lithopedion is readily located by *x*-ray.

If the fetus is free in the abdomen diagnosis is easy. The fetus is of normal size, while the uterus can be palpated independent of the fetus and is not enlarged in proportion to the duration of the pregnancy. The fetal parts can be palpated and placental bruit elicited. The only condition that can simulate it is double ovarian cysts crowded together behind the uterus and this can easily be differentiated, by the absence of fetal parts, placental bruit and fetal heart sounds. Thus diagnosis after rupture should almost certainly be made.

A condition of such varied course and termination and with such indefinite symptoms must of necessity be confused with many conditions. In a differential diagnosis the establishing of the existence or non-existence of pregnancy is sufficient to clear up the diagnosis in most cases. Failing in this, the differentiation becomes much more difficult and often impossible. Careful eliciting of a complete history and thorough bimanual examination are two essential diagnostic measures.

Suffice it to tabulate the chief differential points of the chief conditions involved:

ABORTION	ECTOPIC GESTATION
1. Onset quiet, with gradually increasing regular pains in the lower abdomen, resembling labor.	1. Onset stormy, with irregular and colicky pains, sometimes few and excruciating, localized on one side.
2. External hemorrhage, profuse or moderate, with clots.	2. External hemorrhage slight or absent and dark fluid.
3. Symptoms of hemorrhage proportionate to blood loss.	3. Symptoms of hemorrhage and shock much greater than visible blood loss.
4. Discharge of parts of ovum.	4. Only a uterine decidua, if anything: no villi present.
5. Demonstration of ovum in uterus or uterus empty and pelvis empty.	5. Finding a mass alongside the uterus.

INTRA-UTERINE ANGULAR PREGNANCY	ECTOPIC GESTATION
1. History that of normal pregnancy though, not seldom grossesse angulaire causes occasional slight hemorrhages and pains.	1. History of colicky pains and peritoneal irritation for several weeks, then stormy event (rupture) with severe pains, shock, etc.
2. No expulsion of membranes unless abortion.	2. Expulsion of decidua.
3. No anemia.	3. More or less anemia.
4. Demonstration of tube and round ligament on outside of tumor.	4. Tube and round ligament not palpable, or medial to tumor.
5. Can feel the wall of the uterus pass over into the tumor, especially during contraction.	5. The mass is separated from the uterus by a groove. This is especially deep in pregnancy in an accessory horn.
6. Tumor soft, feels like pregnancy high up in side of pelvis, and moves as a part of the uterus.	6. Tumor harder, lies at side of uterus or in cul-de-sac, and is not movable.
7. Angular portions of uterus contract.	7. No contractions of the sac.
8. Gradually the typical shape of the uterus returns.	8. Tumor becomes more and more asymmetric at successive examinations.

RETROFLEXED GRAVID UTERUS	ECTOPIC PREGNANCY
1. History typical of pregnancy.	1. History strongly suggestive of abnormal pregnancy.
2. Urinary difficulties usual and marked after 10 weeks.	2. Seldom bladder symptoms until after fifth month.
3. Pain and hemorrhage rare and slight.	3. The opposite is the rule.
4. The finger feels the angle at the cervix and nothing where the fundus should be.	4. The finger feels an angle but the abdominal hand finds the fundus, and occasionally the fallopian tubes, in front of the mass.
5. The retroflexed fundus is round, smooth and more or less movable; feels like a pregnancy and sometimes contracts.	5. Mass in the cul-de-sac is irregular, fixed, putty-like, does not feel like a pregnancy, and never contracts.
6. Late in pregnancy, condition is rare and in cases of partial retroflexion an adjacent but empty uterus cannot be felt.	6. Late in pregnancy an adjacent mass which represents the enlarged empty uterus may be found.

APPENDICITIS	ECTOPIC PREGNANCY
1. No signs or symptoms of pregnancy.	1. Present.
2. Pain, nausea, and vomiting, fever.	2. Pain worse, vomiting less, fever absent or less.
3. Tenderness and rigidity high up.	3. Tenderness and rigidity much less and low down.
4. Leukocytosis usual.	4. Leukocytosis equivocal. The blood count shows increased p.m.ns. and mononuclears, the basophiles with the signs of secondary anemia. Low Hb.
5. Patient flushed and excited. At very beginning there may have been a little dizziness.	5. Pale and faint or apathetic.
6. Feel a tumor high up in pelvis.	6. The characteristic findings.
7. Uterus and adnexa normal.	7. Tumor low in pelvis.
8. No uterine symptoms.	8. Discharge of decidua.
9. Abderhalden test usually negative.	9. Abderhalden test positive.

There are various other conditions from which ectopic gestation must be differentiated but in those cases the diagnosis is comparatively easy and the mere keeping in mind the possibility of the condition sets one on the right track. The differentiation from ovarian cyst is perhaps the most difficult if not impossible. This is due to the identity of symptoms in many cases. Ovarian cyst inhibits the periodicity of the menses (as shown by Halban, Rubin and Waters) and may give symptoms of hemorrhage, sudden pain, and other symptoms similar to ectopic pregnancy. In such cases an exploratory operation is advisable.

In conclusion let me say: that the condition of ectopic pregnancy is a serious one and deserving of greater and more serious consideration than it too often gets; that the term ectopic gestation or pregnancy is the one acceptable above all others thus far suggested; that the classification herein stated is thoroughly justifiable and that the conditions which it implies have been definitely established; that the early diagnosis, while difficult and often impossible, should, with careful history taking and proper observation and examination, be made much more frequently than is usually done; and finally that with the present tendency of the general public to look with greater favor on more frequent consultations with physicians the condition will be recognized more frequently.

Treatment, of course, is surgical at the earliest moment that a diagnosis can be made. The condition of the patient will determine the amount of surgery possible but at least the hemorrhage, if present, and the pregnancy must be stopped.

BIBLIOGRAPHY

1. Baldwin: Jour. Am. Med. Assn., 1913, lxi, 6.
2. Beal: Can. Med. Assn. Jour., 1917, vii, 440.
3. Brent: Bull. Univ. Sch. of Med., Balt., 1917-18, 2, 123.
4. Campbell: Memoirs of Ext. Ut. Preg., Edinburgh, 1840.
5. Crossen: Interstate Med. Jour., 1916, xxxiii, 1104.
6. Cyzevicx: Arch. Gynaek., xcvii, 1.
7. Devani: Lancet, 1916, 731.
8. Dougal: Jour. Obst. and Gynec. Brit. Emp., 1914, 158.
9. Foreman: Northwest Med., xv, 206.
10. Green: Ill. Med. Jour., 1916, xxx, 356.
11. Galabin: Brit. Med. Jour., 1903, 664.
12. Gordon: Am. Jour. Obst., lxxv, 1051.
13. Hartz: Surg. Gyn. and Obst., xxiii, 602.
14. Heineberg: Penn. Med. Jour., 1915-16, xix, 267.
15. Heineck: New Orleans Med. and Surg Jour., xviii, 567.
16. Hadley: Indianapolis Med. Jour., 1915, xviii, 475.
17. Harrison: Tr. Am. Gyn. Soc., 1915, xl, 180.
18. Hammacher: Arch. Gynaek., 1910, xcii, 594.
19. Hirst and Knipe: Surg. Gyn. and Obst., 1908, vii, 456.
20. Heineck: Ill. Med. Jour., xxix, 247.
21. Heineck: Med. Fortnightly, xlviii, 39.
22. Heineck: Pacific Med. Jour., lix, 145.
23. Lathrop: N. Y. Med. Jour., civ, 735.
24. Langstroth: Jour. Med. Soc. New Jersey, xiv, 349.
25. Ladinske: Jour. Am. Med. Assn., lxix, 633.
26. Lytle. Med. Rec., xvii, 33.
27. Lytle, C. G.: New York State Jour. Med., lxxxix, 1067.
28. Macrae: Tr. West Surg. Assn., 1915, cxiv, 530.
29. Miller: Am. Jour. Obst., lxxiv, 847.
30. Mooney: Jour. Med. Assn. Georgia, vii, 155.
31. Montgomery, E. E.: Ill. Med Jour., xxix, 254.
32. Nason: Penn. Med. Jour., xx, 719.
33. Noble: Am. Jour. Obst., liii, 497.
34. Norris: Surg. Gyn. and Obst., 1909, 124.
35. Oastler: Surg. Gyn. and Obst., xxiv, 224.
36. Ramsbotham: Obstetrics, 540.
37. Richter: Zentralb. Jour. Gyn., 1912, 175.
38. Reed: Lancet Jour. Gyn., cxiv, 530.
39. Rongy: Am. Jour. Obst., lxxvii, 86.
40. Sittner: Jour. Am. Assn., 1907, 407.
41. Smith: Am. Jour. Obst., 1911, 401.
42. Smith: Jour. Am. Med. Assn., 1912, 1114.
43. Spalding: Jour. Am. Med. Assn., lxv, 1156.

44. Stone: Am. Jour. Obst., lxxv, 239.
45. Sweeny: Med. Rec., xcii, 522.
46. Scavlan: Jour.-Lancet, xxxvi, 285.
47. Strahan: Ectopic Gestation—Thesis.
48. Taylor: China Med. Jour., xxix, 326.
49. Taylor, H. C.: Med. and Surg. Dept. Roosevelt Hosp., 1915, 147.
50. Taylor, John: Extra Uterine Preg. Text.
51. Webster: Ectopic Gestation. Text.
52. Whiting: Tr. Phila. Acad. Surg., xvii, 1-5.
53. Waters: Jour. Am. Med. Assn., lxx, 295.
54. Wallace: Surg. Gyn. and Obst., xxiv, 578.
55. Young and Shea: Boston Med. and Surg. Jour., Feb. 23, 1911.

CLASSIFICATION OF MERCURIALS

The A. M. A. Chemical Laboratory has attempted to work out a method of laboratory investigation and classification of mercurials. A method of evaluating the ionization of the mercury in mercury compounds used in medicine in the belief that this may have a direct bearing on their local irritant and antiseptic action was determined. This method was a modification of the Dresser yeast method which has been adopted in the new Pharmacopeia as a means of testing the silver protein compounds contained in the book. According to the results yielded with this method, the commonly used mercury compounds fall into four distinct classes from the standpoint of ionization. Expressing this in terms of "Efficiency for equivalent of mercury" with mercuric chloride as unity, the first class comprises mercuric bromide and chloride, mercuric potassium iodide, mercuric succinimide, sublamine and metaphen, decreasing in this order from 1.7 units to 0.36 unit. In the second class come the freely ionizable compounds with correspondingly mild irritation: mecuric oxycyanide, cyanide and benzoate, and meroxyl. The third group includes mercurosal and the mercury-fluorescein dyes, mercurochrome, and flumerin. In the fourth class come afridol, which does not ionize enough, and mercuric salicylate, which does not dissolve sufficiently to affect the yeast sensibly. (Jour. A. M. A., July 24, 1926, p. 246.)

DIATHERMY

For the local application of medical diathermy, that is, the heating within physiologic limits of well defined parts of the body, it is permissible to raise the temperature to from 40 to 45 C. (104 to 113 F.) with the proviso that the individual tolerance be taken into consideration. Temperatures beyond 45 C., while not necessarily leading to complete coagulation of albumin, produce injury in the tissues. In general diathermy, usually called autocondensation, the safety limit is the raising of the temperature up to 2 degrees C. (3.6 degrees F.) above the normal. Higher temperatures are apt to lead to severe disturbances. The desirable physiologic and therapeutic effect is brought about by moderate heating, causing an active hyperemia and subsequent amelioration of the local metabolism. (Jour. A. M. A., July 3, 1926, p. 50.)

PATHOLOGY OF PANCREATITIS*

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Secondary pancreatitis of mild grades and usually without symptoms, occurs in the course of infectious diseases, particularly small-pox and typhoid fever[1]. The gland appears swollen and of a reddish color. The gland cells are the seat of cloudy swelling and the hyperemic interstitial tissue is infiltrated by a cellular exudate. If the cloudy swelling progresses to the point of fatty degeneration, the gland becomes a pale yellowish white and of softer consistency. In rare cases definite cavities form containing cellular debris; peritonitis may result. Occasionally this type of inflammation may be associated with hemorrhages into the substance of the pancreas.

Primary Pancreatitis.—Among the most dramatic of all clinical pictures is that designated *Pancreatitis acuta hemorrhagica,* in which the patient is suddenly seized with a deep-seated, paralysing, epigastric pain, followed quickly by symptoms of paralytic ileus, rapidly leading to collapse and even death as though under the influence of some powerful poison. In these cases, the pancreas and its neighborhood becomes a blood-infiltrated mass with numerous areas of fat necrosis. Because of the coincidence of the extensive hemorrhage and the closely associated, widespread necrosis of the tissues of the gland, there appears to exist a close analogy between this condition and the results of the action of activated trypsin in experimental animals. There are also strong grounds for believing that this type of inflammation may result from the reflux of bile or intestinal juice into the pancreas[2].

Suppurative pancreatitis may arise by extension from neighboring organs, for instance, a perforating gastric or duodenal ulcer. Also in pyemia, a condition of pyopancreatitis may arise in which numerous, disseminated abscesses appear in the interstitial tissues. Similarly to the infection of the parotid gland by extension from the mouth, infections of the intestinal mucosa may invade the pancreatic ducts and thence the gland proper; if this is suppurative in character then

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we may have a suppurative inflammation of the entire gland. In this condition the gland swells, becomes very vascular, dark grey in color and is infiltrated with pus. Parenchyma and interstitial tissues are affected; some of the alveoii are swollen with destruction of the cells or become distended with pus, while others, surrounded by suppurative infiltration of the interstitial tissue, are cut off from their blood supply and sequestered. This may happen to a large section of the gland which then lies free in a pus-filled cavity whose walls consist of agglutinated adjacent organs. Exceptionally, rupture into intestine or stomach follows and the necrotic mass is evacuated and healing may result. Chiari[3] reported a case in which the entire gland was carried off through the bowel. Propagating thrombophlebitis of the portal vein may follow suppurative pancreatitis; the vein crosses the posterior surface of the pancreas and is therefore directly exposed to inflammatory involvement by contiguity.

Chronic Fibrous Pancreatitis.—In diffuse fibrous pancreatitis the glandular tissue is destroyed and there is an overgrowth of the inter or intra-acinous interstitial tissues or both. One sees this in localized areas in cases in which an ulcer of the stomach invades the pancreas. In the diffuse involvement, the gland may be increased or decreased in size, extraordinarily hard, yellowish gray in color and give a grating sensation when cut with a knife. The acinous tissue may completely disappear. This condition is known as pancreas induration or cirrhosis; it is found in some degree in a few diabetics. Occasionally the head of the pancreas shows especially severe changes, becomes hard and nodular,—so-called tumorlike chronic pancreatitis. Icterus may be a symptom of this condition due to compression of the common duct. The induration may develop as a secondary result of chronic low grade infection of the pancreas or stone in the duct of Wirsung, gallstones in the common duct, carcinoma of the head or body of the pancreas itself, or carcinoma of the duodenum. In the primary condition congenital syphilis is a common cause, acquired syphilis, rarely; in the former case the process is diffuse; in the latter, one finds localized white scars. Fibrous pancreatitis may occur in conjunction with atrophic biliary cirrhosis. In such cases there is said to be but little alteration in the Islands of Langerhans. Pigment cirrhosis, occurring in a small number of patients with diabetes, should be mentioned in this connection.

Etiology.—All researches have emphasized the association of inflammation of the pancreas with cholecystitis. The classical case described by Opie[4] stands as a striking example of stasis in the biliary and pancreatic ducts due to obstruction at the ampulla of Vater by stone, and secondary invasion of the pancreas from the bile tracts by way of the duct of Wirsung. However, even in cases of pancreatitis with a common duct stone blocking the ampulla, other explanations of the pancreatic inflammation are possible. In support of this the following report of a case with autopsy from the service of Dr. William R. Bagley is presented:

The patient was a man, 72 years of age. He was first taken sick May 21st, and died June 6, 1925. The illness came on suddenly with severe pain in the upperabdomen, intractable vomiting and deepening jaundice, and continued so until death. He had had numerous previous attacks, the first one, the preceding October, lasting two or three days, being followed about every two weeks, by similar seizures.

Examination a week before death and eight days following the onset, disclosed an emaciated man, deeply jaundiced and appearing very ill. The pulse was 90, of fair volume, and regular. His temperature was subnormal. Most of his teeth had been extracted. There was no goiter. Heart and lungs were in good condition. The abdomen was tender to deep pressure in the upper half, and their was no distention of consequence. The extremities were normal. Hemaglobin 78 per cent (Dare), leucocytes 18,000. The urine contained bile, albumin 3 plus, numerous hyaline and granular casts and leucocytes.

On June 1, an exploratory operation under novocaine anesthesia was done. The gallbladder was found distended with yellowish-white, mucoid liquid. Its walls were thick and of a distinctly reddish cast with adhesions to the duodenum. No stones were found. The pancreas, hurriedly examined, was large, soft and smooth except at the head where it seemed hard but not nodular. The common duct appeared to be completely blocked by the head of the pancreas. As the condition of the patient did not seem to warrant more extensive exploration, a rubber tube was placed in the gallbladder and the abdomen closed. Following operation the pain and vomiting continued and the patient died on the sixth day.

At autopsy (by Dr. Hilding Anderson), the interesting findings were in the pancreas and ampulla of Vater. "Pancreas is thickened and contains throughout its substance many areas of suppuration and necrosis." There is no hemorrhage. "A stone is found in the ampulla of Vater. The stone measures 2.5 cm. in

length, about 1 cm. in thickness; it is cylindrical in shape. The common, cystic and hepatic ducts are much dilated. The exit of the pancreatic duct lies at about the middle of the stone." Microscopically, the areas of suppuration and necrosis involve both stroma and parenchyma. Beyond these areas, neither stroma nor parenchyma shows much involvement, and the ducts are but little changed.

In this case a cylindrical stone in the common duct and ampulla lay snugly over the orifice of the pancreatic duct. Who can say whether common duct liquid regurgitated into the duct of Wirsung, or whether there arose a complete or partial damming up of pancreatic liquid which was then primarily responsible for the pancreatic disease.

Lymphogenous Infection.—It is recognized that the lymphatics of the gallbladder communicate freely with those of the liver, both deep and superficial. Likewise, injections into the gallbladder lymphvessels readily find their way into the lymphatics of the common duct and pancreas[5]. Inflammation spreads along lymphatic channels; therefore, anatomically, there is no reason why pancreatitis and cholecystitis may not be secondary to each other, the infection traveling by way of the lymphatics. Since the lymphatics of the liver, gallbladder, common bileduct and pancreas are thus continuous, evidence which points to the lymphatics as the portal of entry for gallbladder infections may be applied to a similar portal of entry for pancreatic infections. In part, this evidence is as follows:

1. The very common association of hepatitis with cholescystitis and of both with panecreatitis.
2. Bacteria injected into the portal vein or its branches, in experimental animals, may be recovered in a few hours from the gallbladder and pancreas even though the cystic duct and cystic artery is ligated previous to the injection in order to prevent entrance of bacteria via the blood or the lumen of the duct.
3. Likewise, inflammation of these organs may be produced.
4. Hepatitis results as a sequel of experimental cholecystitis in which spread to the liver through the blood vascular and duct connections is prevented by ligation.

Hematogenous Infection. — In July, 1921, Rosenow[6] published the results of a series of experiments in which he had succeeded in repeatedly causing cholecystic and pancreatic lesions by the intravenous injection of streptococci. Whether or not we accept Rosenow's ideas on selective localization, the fact of experimental blood-borne pancreatic infection remains. In this connection, the following case reports are offered:

Case 2 (Courtesy of Dr. Lloyd L. Merriman). Mrs. H., aged 40, was first examined April 18, 1921. She complained of pain and tenderness across the abdomen just above the umilicus, not influenced by food taking or by bowel movement; pain in the left lower quadrant of the abdomen; irregularity of the bowels; headache; anterior and posterior nasal drainage; frequent head-colds and sore throats; a bad taste in the mouth; and loss of appetite. Examination showed an undernourished woman; heart and lungs normal; marked tenderness just above umbilicus and to the left, and a palpable, tender, descending colon. The tonsils contained pus, there were five abscessed teeth, and polyps were found in the nose. Transillumination and X-ray of the nasal accessory sinuses showed evidence of wide-spread involvement. Smears from the gums contained diplococci and the organism characteristic of Vincent's angina. Repeated specimens of urine contained sugar. Mucous was present in the stools in abnormal amounts. A diagnosis of pancreatitis with secondary diabetes mellitus, colitis, diseased tonsils, pyorrhea alveolaris, multiple alveolar abscesses and bilateral pan-sinusitis was made. The abscessed teeth and tonsils were removed and radical operations were performed on the sinuses of both sides. The patient has been under observation for nearly five years since the operations and sugar has never been found in the urine in spite of the fact that she is now on an unrestricted diet. The abdominal pain and the evidence of bowel irritation have completely disappeared.

Case 3. Mr. J. F. E., aged 51, was first examined June 29, 1925. The patient complained of headache, occasional sense of fullness in the stomach, lack of energy and constipation. He had had gonorrhea in 1894, typhoid fever in 1895, the tonsils "split" in 1905, the right maxillary sinus opened in 1915 and influenza in 1918. Examination revealed a robust, full-blooded man about 5 feet and 10 inches tall, weighing 200 pounds. The right antrum showed evidence of disease. Blood pressure, 130/90, pulse 72; hemaglobin 96 per cent; leucocytes, 6,700. Urine examination on several succeeding days showed small amounts of sugar, no albumin or casts. A diagnosis of right antrum infection, and pancreatitis with secondary diabetes mellitus was made. Under dietary treatment the sugar rapidly disappeared from the urine; following this, a radical sinus operation was done. Immediately thereafter the urine contained albumin, casts and erythrocytes but no sugar. Complete recovery gradually ensued. This patient has been followed for nearly a year without the reappearance of glycosuria although he has returned to a full diet.

If we may accept the findings in these cases at their apparent face value, we have clinical

verification of Rosenow's experimental results, namely, hematogenous pancreatitis.

SUMMARY

The pancreas presents most of the classical types of inflammation common to tissues in general, modified in certain cases by the specific secretion of the gland itself. Infection may reach the gland via the duct of Wirsung, but the lymphogenous and hematogenous routes are of great, and possibly, of first, inmportance.

BIBLIOGRAPHY

1. Kaufmann: Spezielle Pathologische Anatomie, 1909, 621.
2. Archibald: Section of Pancreatitis, Nelson Looseleaf Living Medicine, New York, 1921, 5, 534.
3. Chiari: Münch. Med. Wchnschr, 1880, No. 6.
4. Opie: Jour. Experi. Med., 1900, 5, Med. News, May 21, 1904.
5. Graham and Peterson: Arch. Surg., Jan 1922, 4, No. 1.
6. Rosenow: Surg., Gyn. and Obst., XXXIII, July 1921, 33 p. 19.

PRESENT STATUS OF B. ACIDOPHILUS AND B. BULGARICUS THERAPY

Recently the question was brought before the Council whether the successful implantation of *B. acidophilus* might be secured in other ways than through administration of *Bacillus acidophilus* milk, and the question was also raised whether *Bacillus bulgaricus* preparations were worthy of continued recognition. To obtain information on these and related questions, a questionnaire was sent by the chairman of the Council's Committee on Lactic Acid Ferment preparations to his associates on the Committee and to others known to have studied the *Bacillus acidophilus* problem. As a result of the information which was obtained, the Council dedided: (1) *Bacillus acidophilus* milk and broth cultures and concentrates of *B. acidophilus* will continue to be accepted, provided the preparations are marketed under non-proprietary descriptive names; provided the number of viable organisms contained in a stated quantity at the time of sale is declared on the label or in the advertising; provided the label bears an expiration date; and provided that for broth cultures and concentrates the advertising emphasize the need of carbohydrate (lactose or dextrin) administration. (2) Other preparations of *B. acidophilus,* such as tablets, emulsions and candies, will not be accepted unless adequate evidence is presented to show that the implantation of *B. acidophilus* may be secured through their use. If such evidence becomes available, they will be accepted under the conditions outlined under (1). (3) *Bacillus bulgaricus* preparations will be retained, provided the claims for these are revised in accordance with modern opinion to show that they are considered to be of value only in the preparation of soured milk and that all claims for their intestinal implantation and for their value as external application be discontinued. (Jour. A. M. A., July 17, 1926, p. 172.)

PHYSIOTHERAPY IN GROUP AND HOSPITAL PRACTICE.*

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Physiotherapy, or the use of physical methods in the treatment of disease, has only assumed the importance it deserves in daily practice since the war. It is not the purpose of this paper to go into the history of physiotherapy, or to deal in detail with all the various forms of physical treatments which are used at the present day, but merely to outline those procedures which, from personal experience and observation, have seemed to be indispensable in the daily routine of hospital and private practice, and to list the principal pathological conditions which are benefited by such procedures. There are, of course, other forms of treatment than those to be mentioned which are undoubtedly useful in certain conditions, but these are omitted either because of lack of experience with them, or because it is felt that the benefit to be derived from them does not justify the necessary outlay in time or money. No attempt will, of course, be made to include *x*-ray or radium therapy in this outline. Surgical diathermy is also excluded.

The treatments are carried out preferably in a separate department, or in rooms permanently set aside for such treatments, and should be under the active supervision of a doctor trained, so far as possible, in the work. The actual work is carried out by trained physiotherapists, but many of the procedures can be performed by an untrained assistant if properly supervised. The necessary equipment can be reduced far below that ordinarily advised and still be sufficient for practically all essential treatments. The character of this equipment varies with the location and the amount of work to be done, but the following has been found eminently satisfactory for giving some six thousand treatments a year.

A separate waiting room and three dressing rooms help to accelerate the work and prevent

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unnecessary delays. In addition, an arrangement of five work-rooms is used, electrical outlets being so planned that movable apparatus is feasible. One room contains a light cabinet and a shower bath as permanent fixtures, and two sinks in different rooms are fitted with wringers for use in giving hot packs. The largest room is the "gymnasium." This room has stall bars along one wall, a set of chest weights with overhead, floor and chest level pulleys, a large mirror fastened to one end wall with a painted line on the floor leading to it, a set of flying rings, and a Sayre's suspension apparatus as its fixed appliances. A few wands, a table for recumbent exercises and a stool for use with the stall bars completes the equipment. The other rooms all have tables for treatments and massage, one of the tables being very low so that the necessary distances can be obtained for Alpine lamp therapy. A chair with a head rest is in the room where the water cooled quartz lamp is used. The electrical equipment consists of a large diathermy machine which can be wheeled to the various rooms, a wall plate, which has been fastened to a portable carriage, an air cooled quartz lamp, a water cooled quartz lamp with its various quartz applicators, a small portable radiant light cabinet for use on extremities, and several small "therapeutic lamps," both of the radiant light and infra-red types. A Bristow faradic coil completes this type of equipment. The various small accessories, such as towels, blankets, robes, etc., need not be listed.

The first of the physical measures which it is desired to bring to your attention is the much maligned diathermy. This agent, owing to its being derived from a piece of rather awe-inspiring electrical apparatus, and to the activity of the manufacturers, has been and is still being terriby abused by various cults outside our profession, and also, it must be admitted, by some of the less scrupulous and more ignorant in the profession. This abuse cannot detract from its value in properly selected cases, and if the agent is looked upon as one for limited use, and not as a cure-all, it will be found to be a powerful aid in the treatment of certain injuries and diseased processes. Diathermy is merely the therapeutic application of a bi-polar, high-frequency current to the body, the result of which is the development of deep heat in the tissues between the two poles and a sedative action on the nerve endings in such tissues. A slight hyperemia of the skin under the electrodes always takes place and there is active dilatation of the smaller blood channels in the deeper tissues due to the heat generated. This means an increase in the blood supply to the part treated, and also a hastening of the venous return from it. The general body temperature is raised after local diathermy due to the dissemination of the generated heat by the blood stream. With these facts in mind the type of case in which diathermy is indicated can be readily picked out, and to list those which seem to react best is all that the scope of this paper permits. Sprains of all types, especially when marked effusion is present, acute fractures, after a sufficient time has elapsed for the bleeding to stop, delayed union and non-union of fractures, acute traumatic arthritis and bursitis, and acute muscle injuries are the traumatic conditions which seem to call for diathermy if it is desired to cut down the disability to the shortest possible time. Subacute infectious arthritis and acute infectious arthritis, if pus is not present, such as is seen in Neisserian infections, frequently improve rapidly and the pain in the acute Neisserian joints is usually relieved almost immediately. Cases of bursitis, myositis, and neuritis, due to chronic infectious conditions, are of course preeminently fitted for diathermy, and many of the chronic urological and gynecological lesions clear up quicker with this agent than with those commonly used. In infantile paralysis the nutrition of the paralyzed muscles is apparently greatly aided by the heat generated in them between the two electrodes. Fibrillation is also said to be arrested. The use of diathermy in pneumonia and pleurisy is favorably reported upon in the literature but I have made no personal observations in this field.

The high frequency current can also be used in the form of so-called auto-condensation in cases of simple hypertension, with excellent temporary, and some permanent, results. Care must be used, however, in the selection of pa-

tients and the effects of treatment carefully checked.

The other forms of electricity which seem to be of definite use in a limited number of cases, are the faradic and galvanic currents. The latter definitely relieves fatigue of muscles and has a sedative effect on nerve endings. Muscular contraction can also be produced by direct stimulation of the muscle tissue itself, without the necessity of the nerve endings being intact. It is important to distinguish between the two poles before using this agent, as they have practically opposite effects. Cases of individual muscle fatigue, "writer's cramp," and some of the paralytic groups respond well to this agent.

Faradism has its greatest value in the diagnosis of peripheral nerve lesions, as it acts through the nerve endings in the muscles, but it also is beneficial in exercising weakened muscles where the endings are still at least partially intact. Cases with peripheral nerve lesions can be distinctly helped if care is taken not to overstimulate the involved muscles.

Under the heading of light therapy two forms must be discussed—radiant light, and the true ultra-violet light as obtained from the direct rays of the sun, the quartz or Alpine lamp, and the carbon-arc lamp. Many forms of so-called violet therapy are concerned, and must not be confused with the true sources mentioned.

Radiant light and heat as obtained from large electric bulbs, either in single holders or in cabinets or groups, cause marked hyperemia in the superficial tissues and the skin, stimulating them as a result of this hyperemia. A definite analgesic effect on pain, frequently deep seated, is noticed and the general bodily metabolism is undoubtedly increased. In any condition where local heat is indicated, nothing superior to radiant light can be found, as the light itself is definitely analgesic, even without the heat.

Hot packs have the same general effect as radiant heat and cause the same stimulation of the superficial circulation with an analgesic action on deep-seated pain. As a preliminary to massage hot packs or radiant heat and light are usually used.

Ultra-violet light, on account of its importance in the therapeutic field, deserves much more space than is possible to give it here. As with diathermy we frequently find this indispensable agent in the treatment of disease greatly abused, but must not condemn it for that reason. The direct, unfiltered sunlight, the light from a quartz burner, and the rays from a carbon arc are the only satisfactory sources of supply. With proper technic for general exposures there is a definite tonic effect on the body functions resulting chiefly in an increase in the hemoglobin, red cells and platelets of the blood, and an increase in metabolism, especially that of calcium. The rays are apparently absorbed by the circulation and distributed to all the body by it. Rickets, medical and surgical tuberculosis, except active pulmonary cases, chronic infections and anemias are the main types of general conditions calling for this treatment. Sometimes an unaccountable effect on deep seated or superficial pain is noticed after exposures. Skin conditions, such as acne, respond so readily to ultra-violet light that its use is decidedly the treatment of choice. For early *x*-ray burns this agent is apparently the only effective one known. The water cooled quartz lamp gives off powerful bactericidal rays which are of the greatest value in the treatment of such conditions as pyorrhea, nose and throat infections, local ulcers and tuberculous sinuses. General radiation should, as a rule, be used in conjunction with this local treatment, especially if the lesion is a tuberculous one.

Massage, as a therapeutic agent, is of immense benefit in certain conditions, but must be carefully and scientifically prescribed, and its limitations understood. In general, massage accomplishes the removal of waste material from the tissues by increasing the venous and lymphatic circulation to the parts, and, secondarily, increases body metabolism. The sedative effect of massage is due to its action on the sensory nerves. Local massage is indicated in sub-acute and chronic traumatic inflammations, and can also be used to a lesser extent in chronic infectious conditions. As an

adjunct to heat and exercise it is invaluable in convalescing fractures. General massage is valuable in the treatment of many medical cases, especially those with lowered bodily tone and those where the sedative action is strongly called for. The various forms of massage and their proper application must be understood if the best possible results are to be obtained.

In the treatment of infantile paralysis the one outstanding measure in the therapeutic field is muscle training. This operation, which aims at the re-education of paralyzed or partially paralyzed muscles, and the development of nerve paths to such muscles, is so important that no brief description will convey its true value, and it can only be mentioned here as one of the procedures which occupies much of the time in a physiotherapeutic department. Only well qualified individuals can expect to obtain results, as the action of all the muscles must be thoroughly understood and the training scientifically applied.

Probably one of the most important physiotherapeutic measures which can be used, and one which has the widest scope in the field of treatments, is exercise. In considering exercise as a therapeutic agent and prescribing it as such, a physician has it in his power to build up certain of his patients far beyond any point which could be reached if this procedure were neglected. Medical gymnastics or corrective exercises consist of systematically arranged motions which must be accurately performed by a willing patient and which when so carried out develop definite muscle groups as planned by the physician. The object of such development is the correction of mechanical faults, such as postural defects, the building up of weakened muscular and bodily tone and the strengthening of cardiac, digestive and respiratory functions. The so-called asthenic type of individual nearly always improves under properly graduated exercises, and the ptosis of the organs which so commonly accompanies this condition is remarkably benefited as the abdominal and other trunk muscles get stronger and perform their work properly. After operations or prolonged illnesses, the disability due to weakness, which is so often present when the patients first get up, can be minimized if exercises of the proper kind are started some time previously. Weak feet and metatarsalgias react so well to the proper exercises that no treatment of these conditions is complete without the addition of this measure.

It must not be thought that each of the measures above listed is an entity so far as the treatment of any certain condition is concerned, for as a rule more than one agent is used. Combinations are necessary and if the actions of the various forms of physical therapeutics are remembered, patients will get the greatest good from their proper application.

It is hoped that some definite idea of the value of physiotherapy has been conveyed by this brief survey of its more important features, for personal observation of daily results obtained in all branches of medicine and surgery with the various agents bears out the contention that no one can afford to overlook or neglect this branch of treatment.

TRYPSOGEN

Trypsogen, G. W. Carnrick Co., is a pancreatic preparation for oral use claimed to have a curative action in diabetes. In an article published under the auspices of the Council on Pharmacy and Chemistry it is stated that reliance on the oral administration of the pancreatic preparations thus far prepared has so little justification in the treatment of diabetes that such practice merits the most vigorous condemnation. It is pointed out that the claim that such preparations exert, in some mysterious manner, a rejuvenating or stimulating action on the diseased pancreas is based on uncontrolled clinical observation and chiefly on testimonials deserving no more consideration than do the similarly ill founded claims of the vendors of "patent medicines." (Jour. A. M. A., July 31, 1926, p. 345.)

GLYEUTHYMENOL

In the information furnished the Council on Pharmacy and Chemistry by the proprietors, Glyeuthymenol was stated to have the following composition: thymol, 30 grains; menthol, 20 grains; eucalyptol, 20 minims; synthetic oil of wintergreen, 30 minims; Indian gum powder, 3½ pounds; sodium benzoate, 10 ounces; glycerin, 2½ gallons; zinc sulphate, 6 ounces, and water, 7½ gallons. The Council reported that the advertising designates Glyeuthymenol as a "vaginal prophylactic" and stresses its use as a preventive of gonorrhea and as a contraceptive. The Council concluded that Glyeuthymenol is an unscientific mixture that is sold with claims which are misleading and unwarranted and that its use is inimical to the public health. (Jour. A. M. A., July 3, 1926, p. 51.)

BRANCHIAL CYSTS AND FISTULÆ*

REPORT OF FIVE CASES

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At about the third week of intra-uterine life, the embryo has developed five branchial arches and four intervening clefts. As development progresses, the arches grow forward from both sides and fuse to form the face and various structures of the neck. The clefts are lined externally by ectoderm, and the pharyngeal side is lined by entoderm. At first these two membranes are separated only by a thin layer of tissue. The germ layers from the arches gradually grow together and obliterate the clefts. At about the end of the sixth week this development should be completed. In a small percentage of individuals, however, embryologic defects occur. When the first arches fail to unite with the fronto-nasal process we have the classic and well known picture of cleft lip and palate.

In the process of obliteration of the clefts, a defect or a remnant may persist. These later appear as cysts or fistulæ in the neck.

The type of lesion depends upon the remaining defect:

1. The opening may be closed internally and externally, the intervening portion being patent and remaining buried in the tissues. This may develop into a cyst which later presents itself in the neck.

2. The internal opening may be closed and the external open, forming an external sinus.

3. Both internal and external openings may be present, resulting in an external and internal sinus.

4. The external opening may be closed and the internal open. Thus an internal sinus appears, either in the tonsillar fossa or about the sinus pyriformis, depending upon which cleft is involved.

This defect is apparently rare. Douglas[1] reports a case in a man who could close his mouth and nostril and force air into his neck, and when pressing on the neck air would escape into the pharynx.

Remnants from the first cleft are of little importance. They appear as small sinuses, often unnoticed, at the upper and anterior aspect of the helix of the ear or on the lobule.

The second cleft is most commonly involved. The sinus from this opens internally into the tonsillar fossa. The third and fourth clefts, less commonly affected, open internally near the sinus pyriformis. The location of the lesion externally is constant. Whether cyst or fistula, it appears at the anterior border of the sterno-mastoid muscle.

Cysts may be present for a long time without giving trouble. As a rule, however, sooner or later they become distended or infected, and the patient is forced to seek relief. If infected they are often opened and become an intermittent discharging sinus.

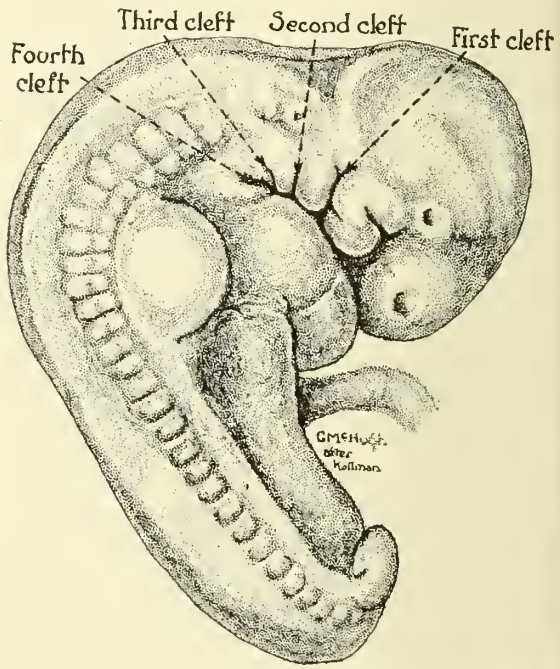


Fig. 1. Lateral view of embryo showing location of clefts.

A fistula may be present for years without giving serious trouble except for a slight discharge. It may heal for a long time, later to open. While healed, it not infrequently becomes infected and has to be opened.

The age at which the cyst or fistula appears varies considerably. Many are present at birth. Most cases are noticed before ten years of age. Practically all cases seek surgical relief before

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 17 to 19, 1926.

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the age of 30. As to sex, they seem to be about equally distributed.

The cyst or fistula may be lined with columnar, squamous or ciliated epithelium, depending on whether it is developed from ectoderm or from entoderm on the pharyngeal side. The contents of the cyst varies. It is often a pea soup like fluid, but sometimes consists of coagulated mucin, usually mixed with pus. Not uncommonly it is mistaken for tuberculous pus. Bailey[2] states that they practically always contain cholesterol, and stresses this as a diagnostic feature. Hemorrhage may occur into a cyst and produce a dark, thick fluid.

The usual history is that some time in early life a cyst or fistula has appeared on either side of the neck. It may have been present at birth. The position is constant. It is located externally at the anterior border of the sternomastoid, usually between the angle of the jaw and the sterno-clavicular junction. If a cyst, it may have remained a painless swelling without any material change for a long time. If it has become infected it may have opened by itself or have been incised, and persisted as a discharging sinus. If it first began as a fistula, it may have discharged a mucopurulent material for many years, often healing for considerable periods. The patient seeks relief because of the discharge, or else it has become infected and formed an abscess.

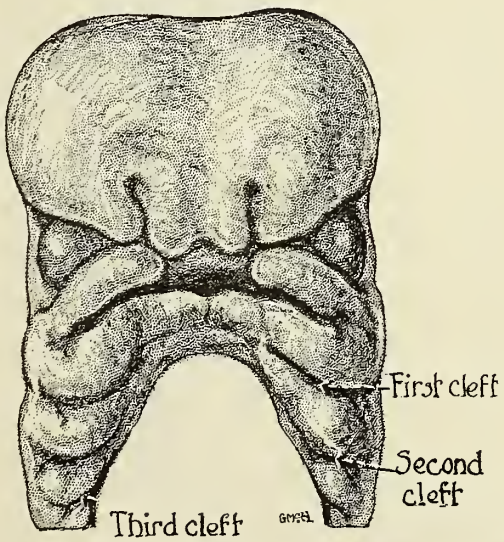


Fig. 2. Anterior view of embryo showing position of arches and intervening clefts.

On examination the cyst may vary in size from 1 cm. to one involving most of one side of the neck. If it is not too tense it can easily be felt to fluctate. An aspirating needle will usually reveal a moderately thick mucopurulent fluid. The fistulous tract can often be traced from its opening upward underneath the sterno-mastoid as a thick fibrous cord till it disappears higher up in the deep structures of the neck. Injection of methylene blue will pass into the mouth if the internal opening is patent. A thin bismuth paste, as suggested by Gilman,[3] can be injected into the sinus, and a stereoscopic x-ray will reveal the exact location and extent of the lesion.

With the above history and findings, the diagnosis should not be difficult. There are several conditions, however, with which it may be confused.

1. Broken down tuberculous gland. In such an instance there are usually other glands present.

2. Malignancy with cystic degeneration. A biopsy will give the information. There is some question whether a branchial remnant may itself become malignant. Bevan[4] cites several such instances and states that branchial remnants may be responsible for some primary malignancies in the neck.

3. Thyroid cysts may very closely simulate branchial cysts. They can, however, usually be traced to their attachment to the gland, and they move with it.

4. Thyroglossal cysts and fistulæ. These are practically always in the mid-line of the neck on the thyroid cartilage, but may be situated to one side.

5. Cystic hygroma. These originate from cavernous lymphangiomas, are usually lobulated, and contain a translucent fluid.

6. Lipoma, deep seated. Aspiration reveals no fluid.

7. Chronic retropharyngeal abscess—probably rare. An example of this was encountered by Coakley[5] in which he found a branchial cyst in this locality.

When this condition becomes troublesome treatment consists of surgical removal. Injections of various kinds have been used in the past but have as a rule proved unsatisfactory. The surgeon should exercise his judgment as to the proper time for undertaking such a procedure.

Unless it is giving considerable trouble, it should not be attempted in children. All abscess formation or inflammation should be allowed to completely subside. The operation should not be undertaken lightly since it usually involves dissec-

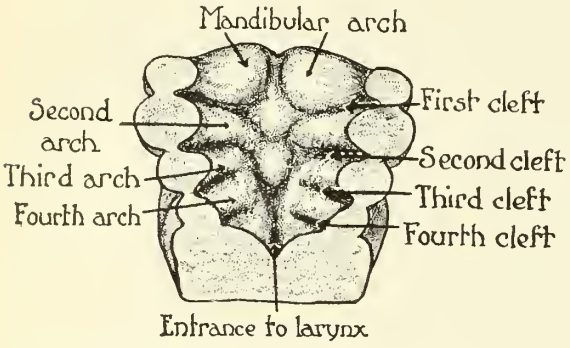


Fig. 3. Longitudinal section of embryo—showing position of clefts and arches.

tion of many important deep structures in the neck. Frazer[8] says that the location of the tract is determined embryologically, and is always constant. He states that remnants from the second external cleft pass between the external and internal carotids, in front of the vagus, to reach the pharynx at the tonsillar fossa, and that those from the third external cleft pass behind the common carotid and in front of the vagus to the pyriform fossa. However this may be, the sinus passes through these important structures high up into the neck, and great care should be exercised in its removal. If the inner end of the sinus terminates in a blind pouch or a fibrous cord, which is often the case, it is not so difficult. If however it opens into the pharynx, the procedure at once becomes more cumbersome. The method of choice seems to be to pass a flexible probe into the fistula from the pharyngeal side, tie the tract to this and invert it into the pharynx. Occasionally inflammatory adhesions of the surrounding structures are so great that only a partial removal can be accomplished. In such cases the lining should be thoroughly cauterized with carbolic or actual cautery. If the tract is completely removed, there will be no recurrence. It is usually well to leave a small drain in the wound for one or two days.

Branchial cysts and fistulæ are of comparatively uncommon occurrence. They appear often enough, however, so that they should always be taken into consideration in making a differential diagnosis of similar lesions in the neck. It is with this object in view that I am reporting the following cases.

Case 1—The patient, a female aged 24, came to the clinic August 29th, 1921. She gave a history that about a year and a half ago she had had a tonsillectomy and one week later a small lump appeared at the angle of the left jaw. Occasionally it became distended and caused a little discomfort. It had gradually enlarged.

General physical examination was negative except for extensive decay of upper and lower molars. There was a fluctuating tumor as large as a medium sized orange extending from the lobe of the left ear to the level of the thyroid cartilage, just anterior to the sterno-mastoid. Forty-five c.c. of a mucopurulent fluid was aspirated. Culture was negative.

Diagnosis: Branchial cyst.

At operation a cyst was removed, lying anterior to the sternomastoid and extending down to the tonsillar fossa, where it was attached by a small blind pouch. It did not communicate with the pharynx. The cyst was lined with stratified squamous epithelium. Uneventful recovery followed.

It is quite probable in this case that the sinus opened into the tonsillar fossa, and that when the tonsils were removed it became obliterated and the cyst began to form.

Case 2—A boy, aged 14, was examined at the clinic April 10, 1922. At this time he had a large tender fluctuating abscess on the right side of his neck, just above the clavicle on the anterior border of the sterno-

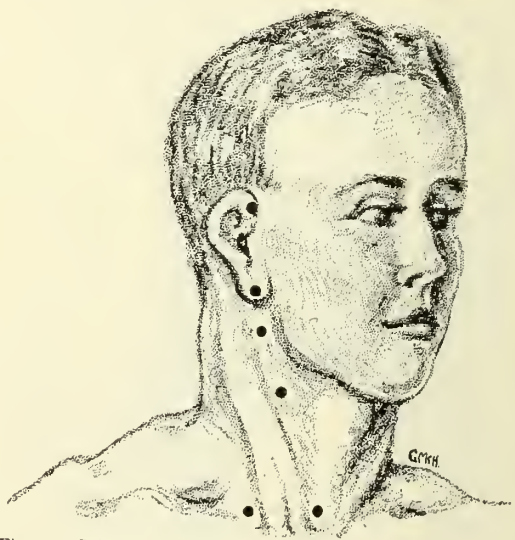


Fig. 4. Schematic drawing showing external location of cysts and fistulæ.

mastoid. This was at once opened and contained a large amount of thick yellow pus.

His father said that at birth or a few days later a discharging sinus was noticed at the site of the present abscess. This discharged till he was six years of

age and then healed for four years. After an attack of influenza it formed an abscess which was incised. Since that time it had closed several times but about once a year formed an abscess which had to be opened. June 5, 1923, he again returned. At this time a small cystic mass was present where the former abscess had been. This could be traced upward under the sterno-mastoid to the level of the thyroid cartilage.

Diagnosis: Branchial cyst.

At operation, June 5, 1923, the cyst was removed without rupture and extended from the sterno-clavicular junction upward underneath the sterno-mastoid. passing between the external and internal carotid to the tonsillar fossa, where it ended in a narrow, thin funnel, patent to its termination. It did not open into the pharynx. The cyst contained 2 ounces of semingelatinous fluid and was lined with stratified squamous epithelium. Recovery was uneventful.

Case 3—A girl, aged 17, was admitted to the University Hospital April 29, 1925, with acute appendicitis for which she was operated. During the physical examination a swelling was noticed on the right side of her neck just anterior to the sterno-mastoid and about midway between the thyroid cartilage and the sterno-clavicular junction. This, she said, had been present as long as she could remember, and except for occasional swelling had given her no trouble.

Diagnosis: Branchial cyst.

Operation was performed May 18, 1925, under local anesthesia. The cyst extended up under the sterno-mastoid, between the external and internal carotid, then down behind the trachea, and ended at the tonsillar fossa. Methylene blue was injected and there was no communication with the pharynx.

Pathological report: A pear-shaped cyst 5x3x2 cm., inner wall smooth and filled with coagulated mucin. No section made.

Diagnosis: Branchial cyst.

Recovery was uneventful.

Case 4—A male, aged 21, was admitted to the University Hospital November 27, 1925, with a discharging fistula on the left side of the neck.

History: At birth a small fistula was noticed on the left side of the neck. This discharged a seropurulent material up to seven years ago, when it healed. Four months ago it became swollen and since then discharged a purulent material which constantly soiled his collar.

Examination revealed a small opening just above the left sterno-clavicular junction. A band of induration extended upward from this underneath the sterno-mastoid. An attempt was made to inject a thin bismuth paste for *x*-ray study, but the opening was so small this could not be accomplished.

Diagnosis: Branchial fistula.

Operation, December 14, 1925. General anesthetic. A long cyst was dissected out from under the sterno-mastoid and extended upward between the external and internal carotid to the tonsillar fossa. It did not open into the pharynx. Specimen consisted of a cyst 5 cm. by 1 cm. lined with stratified squamous epithelium.

Diagnosis: Branchial cyst.

Uneventful recovery followed.

Case 5—A boy, aged 7 months, was examined at clinic March 3, 1923.

Three weeks after birth the mother first noticed a small opening on the left side of the neck. This had remained open except for a few days at a time.

Examination revealed a small fistula discharging a drop of thick clear mucin when the baby cried. It was located on the left side of the neck midway between the thyroid cartilage and the sterno-clavicular junction and opened at the anterior border of the sterno-mastoid. A slight thickening could be felt extending upward underneath the muscle.

Diagnosis: Branchial fistula.

The parents were advised that unless the fistula gave serious trouble the child should not be operated until it was five years of age.

A letter from the parents April 30, 1926, states that the fistula has been healed about one year and the child is well.

CONCLUSIONS

1. Branchial cysts and fistulæ result from a remnant or defect in obliteration of the branchial clefts.

2. They are relatively uncommon but should be kept in mind in making a differential diagnosis of similar lesions in the neck.

3. They contain a mucopurulent material, and are not infrequently confused with broken down tuberculous or malignant glands in the neck.

4. The location is constant. They always appear at the anterior border of the sterno-mastoid.

5. The onset is usually during the first decade of life and most cases seek relief before the age of thirty.

6. The treatment is surgical removal.

BIBLIOGRAPHY

1. Douglas: Ann. Surg., 67, 240, Feb. 1918.
2. Bailey: Brit. Jour. Surg., 10, 565, Apr. 1923.
3. Gilman: Jour. Am. Med. Assn., July 2, 1921, p. 26.
4. Bevan: Surg. Clin., Chicago, 4, 1, 1920.
5. Coakley: Cited by Bailey, Brit. Jour. Surg., 10, 571, Apr. 1923.
6. Frazer: Brit. Jour. Surg. 11, 41, July 1923.

RESULTS OF THE SCHICK TEST AT THE UNIVERSITY OF MINNESOTA

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Statistics showing the percentage of persons susceptible to diphtheria, as evidenced by a positive Schick test, are being reported from various sections of the country and indicate that Park's much quoted figures are not widely applicable. The tests reported in this paper were performed over the past three years upon students entering the University of Minnesota and, as such, will serve as an index of the immunity in a limited age group in Minnesota as compared to other states.

TECHNIC

In making these tests, tuberculin syringes and 5/8 inch, 25 gauge platinum-iridium needles were used. No toxin was used more than twenty-four hours after being diluted. The amount of toxin inoculated was 0.2 c.c. containing 1/50 M.L.D. Heated toxin was used as a control. The inoculations both for the test and for the control were made on the same forearm, the control below and the test above. The toxin was obtained from several different commercial laboratories and from the department of bacteriology of the University of Minnesota. So far as could be judged, without a special study, the various toxins gave similar reactions. Pseudo reactions were interpreted as being negative and combined reactions as positive.

SUSCEPTIBILITY

The total number of students tested during three years was 8,089, of which 5,183 were boys and 2,906 girls. Of this total number tested 52 per cent were positive and 48 per cent were negative. Of the boys 51 per cent were positive and 49 per cent negative; while of the girls 54 per cent were positive and 46 per cent negative.

The total of 52 per cent positive and 48 per cent negative compares with the reports on similar groups from other parts of the country as follows:

Name of Institution	Number tested	Positive	Negative
University of Minnesota	5,183	52%	48%
University of California[1]	329	69%	31%
Smith College[2]	305	77%	23%
McCormick Institute, Chicago[3]	752	71%	29%
Boston Nurses and Medical Students[4]	500	60%	40%

RESULTS ACCORDING TO AGES

It has been noted by practically every one who has studied the Schick reaction that the highest percentage of positive tests occurs between the ages of one and two years and that the decrease in the number of positive tests is gradual and regular up to adult life. For example, Park reports the results of the Schick test in various age groups in New York City as follows:

6 to 12 months	60	per cent positive
1 to 2 years	70	" "
2 to 3 years	60	" "
3 to 5 years	40	" "
5 to 10 years	30	" "
10 to 20 years	20	" "
Over 20 years	15	" "

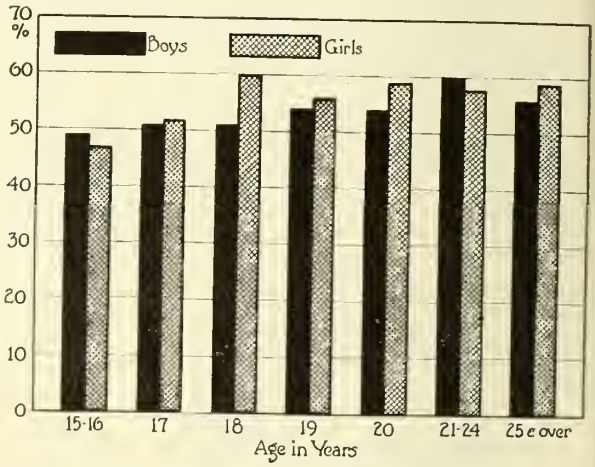


Fig. 1. Percentage of positive Schick tests according to age.

Kelly, Stevens and Beathe in California report the following results[1]:

1 to 4 years—Male	76.6	per cent positive
Female	78.7	" "
5 to 9 years—Male	67.9	" "
Female	72.4	" "
10 to 14 years—Male	51.4	" "
Female	65.2	" "
15 to 19 years—Male	41.5	" "
Female	59.0	" "

The age distribution of the students tested in this study was small, so the results according to age could be analyzed only for age groups covering for the most part a single year. Such distributions are shown in Figure 1.

As will be seen from this figure there is very little difference in the percentage of susceptibles in these age groups but a tendency for a slight increase from 16 to 21 years of age will be noted. This is contrary to what has been reported by others and no explanation for it is apparent.

SUSCEPTIBILITY ACCORDING TO SIZE OF HOME COMMUNITY

Various writers have reported that the percentage of susceptibles is higher among children from rural communities than among children from the cities[3,6,7] and higher among children from better homes than among poor children.[2,8] The probable reason for this is that the children from rural communities and from better homes have less exposure to repeated small doses of infection which produce a so-called "natural immunity."

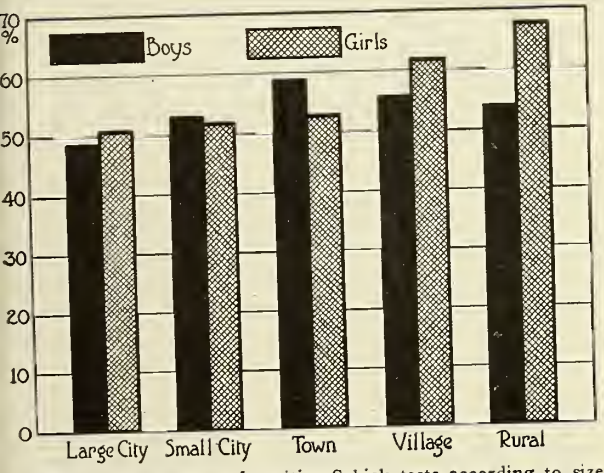


Fig. 2. Percentage of positive Schick tests according to size of home community.

Figure 2 shows the relative amount of susceptibility in students from communities of various sizes. The residence of a student was taken as the place in which he had spent the major portion of his life previous to entering the University. The groupings according to size* are the same as were used in the studies of physical defects and past diseases of students at the University of Minnesota.[9]

These tests show the lowest percentage of susceptibles among the students from large cities and a tendency for the percentage of susceptibles to increase gradually as the home communities became smaller.

*The classification of communities according to population was as follows: Large cities, 50,000 or more; small cities, 5,000 to 50,000; towns, 1,000 to 5,000; villages, 50 to 1,000; rural, less than 50.

RELATION OF TEST TO HISTORY OF DIPHTHERIA

The experience of clinicians is that as a general rule one attack of diphtheria does not confer an immunity to subsequent attacks. But why, then, can an immunity be developed by the injection of toxin-antitoxin, is a question frequently asked. Surely, one reasons, it would seem that toxin liberated during an attack of the disease should be more effective in producing a permanent immunity than the small amount of toxin injected with the toxin-antitoxin mixture. Doubtless this would be true were the toxin during an attack of the disease allowed to remain free to act as an antigen in stimulating the development of a prolonged immunity. However, when a child contracts diphtheria, the recovery of the child from that attack is far more important than its development of a prolonged immunity; so whenever a case of diphtheria is diagnosed, the attending physician gives antitoxin in quantities presumably sufficient to more than neutralize all free toxin. As a result, unless the antitoxin is given late, the patient will not develop any active, prolonged immunity. The mild undiagnosed cases that do not receive antitoxin, probably account for much of the so-called natural immunity which is found as people get older.

Of the students in this group who gave histories of having had diphtheria, 41 per cent had positive and 59 per cent negative Schick reactions.

COMMENT

This analysis of the results of the Schick test at the University of Minnesota shows a relatively large amount of susceptibility in a group of young adults. As would be true of any student body the group is somewhat selected as compared to the general population, but when we find, even in a somewhat selected group, that 52 per cent of young adults are susceptible, there must be a much larger proportion of the children of grade school age susceptible. In New York, where at the age of 15 to 20 years only 20 per cent were susceptible, Park[5] found 70 per cent of children 1 to 2 years of age susceptible. In Minnesota with 52 per cent of University students susceptible at the age of 1 to 5 years, one would expect a much higher percentage than the 30 to 70 per cent found in New York City. This

large proportion of susceptibles in Minnesota is particularly interesting at this time since the State Board of Health is providing toxin-antitoxin for administration to the school children throughout the state, and it would indicate that such a large proportion of children of school age or lower are susceptible to diphtheria that it is most practical to give all of them toxin-antitoxin inoculations without first performing Schick tests.

SUMMARY

1. During the past three years 8,089 Schick tests have been performed on students entering the University. Of this number 5,183 were on girls and 2,906 on boys.

2. Of the total number tested 52 per cent gave positive reactions, indicating susceptibility to diphtheria toxin.

3. The percentage of positive reactions was slightly higher among the girls than among the boys.

4. The age distribution in this group was small but there was not the expected decrease in susceptibility among the older ones.

5. There was a slightly greater amount of susceptibility among students from the smaller communities than from the larger.

6. The large proportion of susceptibles seems to indicate that in dealing with children of school age or younger in Minnesota, it would be more practicable to give all of them toxin-antitoxin inoculations than to inoculate only those shown to be susceptible by a previous Schick test.

BIBLIOGRAPHY

1. Kelly, Frank L., Stephens, Ida May, and Beattie, Margaret: Results of Schick test in California. Pub. Health Rep. 40, 2645, Dec. 4, 1925.
2. White, B.: Group reactions to the Schick test. Bost. Med. and Surg. Jour., 189, 1026, Dec. 20, 1923.
3. Crooks, T. T.: Schick test and toxin-antitoxin immunization. Jour. Am. Med. Assn., 84, 196, Jan. 17, 1926.
4. Hooker, S. B.: Active immunization of adults against diphtheria. Bost. Med. and Surg. Jour. 190, 295, Feb. 21, 1924.
5. Park, W. H.: Collected studies from the research laboratories. Dept. of Health of the City of New York. Vol. 8, 1915.
6. McGuire and Hitchens: Diphtheria survey in citizens training camp. Jour. Am. Med. Assn., 80, 665, Mar. 10, 1923.
7. Kidder, C. W.: Schick tests and immunization against diphtheria in eighth sanitary district of Vermont. Pub. Health Rep., 38, 663, Mar. 30, 1923.
8. Zingher, Abraham: Schick tests performed on more than one hundred and fifty thousand children in public and parochial schools in New York. Am. Jour. Dis. Child., 25, 392, May, 1923.
9. Shepard, W. P., and Diehl, H. S.: Rural and urban health. Jour. Am. Med. Assn. 83, 1117, Oct. 11, 1924.

AID FOR THE TRAINING OF LEADERS IN NURSING

"Whatever the solution of the nursing problem, one thing seems certain. There will, in any event, be a need for able and thoroughly trained women as administrators, teachers, and supervisors. It is this training of leaders in countries in which coöperation in public health or medical education or both is being given that primarily appeals to the Foundation.

"Ordinarily, except in cases of wide sectional differences, aid is confined to one government or university school in a given country. Assistance takes several forms: contingent gifts toward buildings and equipment, contributions, usually in decreasing annual sums, to current budgets over a series of years, fellowships for persons of exceptional ability, and study visits abroad for selected administrators.

"During 1925 the Foundation supported a School of Nursing in the Peking Union Medical College; contributed to the budget of the Yale University School of Nursing, which now grants the degree of Bachelor of Nursing to university matriculants who complete successfully a combined five-year course in the science curriculum and in nursing education; made similar grants to Vanderbilt University and the George Peabody College for Teachers, Nashville, Tennessee, which jointly conduct a hospital and public health nursing course; pledged $130,000 toward a nurses' home project and contributed to the teaching budget of a Brazilian government school of nursing in connection with the Hospital Gerál de Assistencia in Rio de Janerio; and aided the same sort of plan for building and maintenance at the Cracow University School of Public Health and Bedside Nursing in Poland.

"In addition to this characteristic program a variety of appropriations, large or small, for nursing service or education were made in connection with different phases of the Foundation's work. Thus aid was given to the Public Health Nursing Service of the Brazilian Department of Health in Rio de Janerio and to the Bureau of Public Health visiting, France. Minor forms of help were rendered to the Salpêtrière School in Paris, the Charité School in Lyon, the University College Hospital School in London, the Nursing School in Zagreb, Yugoslavia, and that of the Elizabeth Sleeper Davis Memorial Hospital, Peking."—Rockefeller Foundation.

DIAGNOSIS AND TREATMENT OF EMPYEMA IN THE HOME*

H. J. Lloyd, M.D.
Mankato, Minn.

As home treatment of empyema differs but little from hospital or dispensary treatment, we shall include some important points of diagnosis in this brief discussion of the subject. The lack of X-ray and laboratory facilities usually force the general practitioner to depend chiefly upon the history and clinical findings of the case, and the proper use of the diagnostic needle. The difficulties of diagnosis by these means alone, however, makes it imperative that the general practitioner avail himself of the benefits of laboratory and X-ray facilities whenever they are within his reach.

Diagnosis—The well known symptoms of fever, sweating, rapid pulse and respiration, persisting after the expected termination of an acute inflammatory process in the lungs, need not be elaborated upon here. Inspection of the thorax to determine equality of excursion of the lower portions or of fixation of the upper portions is an important point to observe. Tenderness of the intercostal spaces; extreme flatness on percussion and tubular breathing near the upper border of the dull area should make one suspect an empyema rather than a serous effusion. Retraction of the chest wall on the affected side is common in cases of long standing empyema, especially in children. We would like to stress here the fallacy of making a diagnosis of "unresolved pneumonia." One is often tempted to make this diagnosis after repeated dry taps. It is doubtful whether or not this condition ever exists and it is to be regretted that so much space is given to the subject in some otherwise good text-books. If deligent search be made, the so-called "unresolved pneumonias" will resolve themselves into empyema, lung abscess, tuberculosis pneumonia or neoplasm. Many cases have been neglected or improperly treated as a result of such a diagnosis.

A history of frank lobar pneumonia, recrudescence of fever after the crisis, and a thick creamy pus aspirated during the first or second week following the crisis should usually lead to a diagnosis of pneumonoccic empyema. The amount of pus is usually not large and one seldom finds abscesses in the lung associated with it. Following broncho-pneumonia or influenza, the material aspirated at first is of a thin sero-purulent character and of a grayish yellow color. It is usually more extensive and may be associated with multiple abscesses of the lung. The streptococcus is the chief etiological agent in these cases, and the virulent course and rapidly fatal termination is usually found in this class. Those of us who had experience in the military service in 1918 can well recall our bitter experiences with the streptococcus empyemas following influenza.

When the aspirated fluid is of a thin, translucent or merely cloudy character, and the history of the case shows a gradual onset of the primary lung infection with progressive involvement of the lung and increasing intensity of other symptoms, one should look for a tuberculous process. The prognosis is bad, especially if there is evidence of a mixed infection in which the streptococcus has invaded the tuberculosis fields.

There is one other condition to which the attention of the general practitioner should be called and that is the finding of a milky or chylous fluid. When this fluid is found, one should immediately think of malignancy in the lung. The fluid may also be tinged with blood and forms rapidly and in increasing quantities following aspiration. Search should be made for enlargement of the "pilot" glands in the supraclavicular spaces at the root of the neck and also among the axillary glands. The onset may be sudden and thus misleading. We can recall a case which came under our care about two years ago. The patient had been in apparently good health, when he had a chill, and perspired profusely. Temperature rose to about 102, and effusion formed rapidly in the left pleural cavity. Very large quantities of a milky fluid were repeatedly aspirated. Fatal termination came in about three months. Biopsy of a superficial gland had shown evidence of lympho-sarcoma, and autopsy revealed a severe general sarcomatosis, in which nearly all the organs, as well as the lungs, were extensively involved.

We wish to stress here the importance of the fearless use of the aspirating needle. In general practice, this should be our chief reliance. Undoubtedly we are reluctant to subject our patients

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 17 to 19, 1926.

to this procedure as they are usually weak and nervous when afflicted with this complication, but the delay caused by this timidity may delay diagnosis and proper treatment, and cause irreparable damage to the lungs and kidneys.

Treatment—As this discussion of the subject is from the standpoint of the internist and general practitioner, the matter of treatment may be expressed in one short phrase—Prescribe a surgeon. However, the opportune time for surgical interference must be chosen carefully. When one is fairly sure that he has a pneumococcic empyema to deal with, one aspiration should be performed, and if the symptoms do not subside and there is evidence of reaccumulation of pus, then the patient should be sent to a hospital and proper surgical drainage established. If one is dealing with a streptococcus or mixed infection following broncho-pneumonia or influenza, then repeated aspirations should be performed at intervals of a few days, until the pus becomes thick and general symptoms show that nature's protective wall has been well established. The case is then ready for the surgeon. Operating too soon is dangerous is this type of empyema, as the experience in the army during the influenza epidemic of 1918 clearly taught us.

We shall not discuss here the relative merits of the open or closed methods. Selected cases may be successfully treated by the injection of gentian violet, 1:1000 solution, or a 2 per cent solution of mercurochrome. Major reports a high percentage of cures in a series of cases by this method. We have also seen some good results from it. However, taken as a whole, empyema belongs to the field of surgery, and meddlesome medical procedures may work harm to the patient.

NEW YORK'S NEW MEDICAL PRACTICE LAW

The House of Delegates, at Dallas, unanimously adopted a resolution thanking Governor Smith of New York for his interest in the protection of the people against quackery and urging him to approve the medical practice act passed by the legislature. This act, known as the Webb-Loomis bill, was recently signed by the governor and has had the support of the Medical Society of the State of New York. It requires every physician to register annually and to pay a fee of two dollars, on or before January 1. A list of the physicians so registered is to be sent to each registrant in March, with a request that he report every known practitioner of medicine whose name is not listed. Registration fees are available for the enforcement of the act. The Board of Regents, the licensing body, is authorized to appoint inspectors to enforce the law throughout the state. Prosecutions are to be by or under the direction of the attorney general, and not by local district attorneys as at present. A "committee on grievances" is to be appointed by the Board of Regents, consisting of seven licensed physicians appointed from lists submitted by the Medical Society of the State of New York, the New York Homeopathic Society and the New York State Osteopathic Society, and three appointed independent of such nominations. This grievance committee may hear all charges against licensed physicians looking toward the revocation of their licenses. It merely reports its findings and recommendations, however, to the Board of Regents. The board may accept or modify the findings and recommendations of the committee, and in any case the defendant may appeal to the courts. The grievance committee may act as a board of arbitration in controversies between two or more physicians, or between a physician or physicians and other person, if the parties so request. The new law, correcting a condition disclosed by a recent decision of the New York Court of Appeals, provides that in an action for damages for personal injuries or death against an unlicensed person, arising out of an act or acts constituting the practice of medicine, the fact that such person was practicing without license shall be deemed prima facie evidence of negligence on his part. An alien seeking a license to practice medicine must have declared his intention of becoming a citizen, and if he fails within six years from the date of such declaration to furnish evidence of naturalization, his license terminates. In view of the time and energy that have been devoted to the drafting and enactment of this law, the profession will look forward with interest to the results accomplished by it. The physicians of New York are apparently almost unanimous in their belief that, when effective, it will do much to protect the public against medical vagaries. (J. A. M. A., May 1, 1926.)

THE ACTION OF ACETANILID

The use of acetanilid, phenacetin, and other aniline derivatives may bring about symptoms similar to those of aniline poisoning. For acetanilid it has been shown that, like the mother substance, aniline, it also fails to produce methemoglobin despite the allegations of a positive sort in the medical literature. The action of acetanilid on the blood, heart, and circulation is essentially the same as that of aniline. Both form paraaminophenol in the body, and this may account in part for the cyanosis sometimes observed. Prolonged administration of sublethal doses of acetanilid also produces anemia and emaciation. (Jour. A. M. A., July 10, 1926, p. 103.)

RECENT PROGRESS IN PSYCHIATRY*

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The old adage that there is nothing new under the sun probably applies to psychiatry today. However, at no time in its history has there been such widespread interest, both in and out of medical circles, or such activity within its field. Psychiatry of the ninteenth century may be termed materialistic—the attempt was made to interpret practically all its problems from this standpoint. When Hoche first postulated that hysteria was a psychogenic reaction, he was looked upon as being unscientific. It is needless to say that from a histopathological standpoint progress in mental disease has been disappointing. In fact, it was probably stagnant and lagged behind other branches of medicine very largely because of this viewpoint.

Bumpke expressed the trend in psychiatry today as a swing from the materialistic to that of the romantic. The War brought forcibly to our attention the great importance of psychogenic factors as causes of mental trouble, with its immense material of hysteria, neurasthenia, fatigue neurosis, and other functional conditions. The work of Janet, Freud and Jung has introduced a psychologic conception into the solving of these problems. The immense literature on psychoanalysis attests the interest in this work. Freud has given us a new view in the domain of the neurosis. He has been severely criticized, and probably justly, in his standpoint of the omnipotence of sex in causing mental disorders. However, a psychology has arisen which attempts to untangle and trace and bring to light the many and often twisted roots of neurotic conditions. The facts and realities that are brought forward are not what is objected to in psychoanalysis, but it is the interpretations that have often been made of these facts. Bleuler states that we should give credit to Freud for the mere fact that psychology has been brought into the field of psychiatry at all. The rôle of the subconscous, the effect of emotional conflicts, and the fundamentals of a psycho-pathology have been gradually laid down. It has given us a dynamic conception of and a more hopeful method of approach to this great problem.

The general trend of medicine being toward prevention, psychiatry has happily made definite advances in this regard. Within the last decade, the years of infancy and early childhood with their many problems have for the first time been systematically studied. This is probably the most important period of life in considering the developing emotional and intellectual life of the individual. In the field of criminology, attempts have been made in tracing delinquency and antisocial conduct to its source. For this purpose child guidence clinics have been established in the large centers. Probably nothing of much value has as yet been achieved, but it is an important work nevertheless.

Mental hygiene, its importance to general medicine and to the community, is becoming more clearly recognized. Beginning with the preschool child, up through the schools and colleges, mental hygiene is for the first time receiving due recognition. In fact, the main duty and work of modern psychiatry is not the custodial care of the insane, but that of bringing psychiatric principles to the public, by education, by guidance clinics, and by general medicine. Its purpose is that individuals may attain proper spheres of activity compatible with their mental and emotional capabilities, not by pampering or sheltering them from situations, but by proper guidance, vocational and otherwise, thus helping them to overcome emotional conflicts, and certain environmental and other preventable influences which often warp an individual's personality, and prevent him from being the social factor he should be.

Mental deficiency has remained a pessimistic and hopeless problem in the past. The studies of the Kalikak and Juke families, with their descendants in poverty, crime and feeblemindedness have been broadcast with a dramatic flourish. Practically all this was thought to be due to bad heredity, and as we obviously cannot change heredity the problem became a fatalistic one. However, our attitude has become more hopeful Myerson severely criticizes the work of Goddard and others in their studies and conclusions. He shows that the crux of all their work depended on social field workers, who judged the mental

*Read before the annual meeting of the Minnesota State Medical Association, Saint Paul, May 17 to 19, 1926.

capacity of the quick and the dead running back to the revolutionary days, and the mating of a soldier Kalikak and a nameless woman with their subsequent chain of descendants alluded to above. Modern work has shown that feeblemindedness and deficiency are not always due to heredity. Trauma during the natal and post-natal period, acute infection during early childhood, such as scarlet fever, whooping cough, meningitis and encephalitis, may cause many cases of brain defect. The mental deficiency resulting from these causes is as great as that resulting from heredity. It has not been proven that the acquired defect is passed on to descendants. If this is not the case, it gives us a more hopeful attitude, and a less pessimistic outlook, when speculating as to the rating of the mental capacity of the future generation. Bleuler, at least, has rightly remarked that too much has been said of heredity in the past. We cannot change it, its importance is realized, its significance in relation to the future must be considered, but the environment and the individual himself as he comes to us is what we must work with.

One of the present day advances in psychiatry, the importance of which cannot be overestimated, is the disappearance of the ancient concept of dualism—of a separate entity of mind and body —by the majority of medical men and the public in general. Along with the brilliant advances of the last forty years of medicine and surgery, psychiatry became the stepchild, or, in reality, the brat, of medicine. Adolp Meyer's term of psychophobia justly described the average medical man's attitude toward mental troubles. As a result, medicine suffered, and we have seen the growth of cultism as a direct consequence. For the first time, psychiatric problems are not being simply treated as disorders of the mind, but from the standpoint of the organism as a whole. It is common knowledge that emotions have practically as much to do with a man's digestion and internal secretions as the brain itself. Cannon, Crile, and others have shown the effect of the emotion on the endocrines. We know that the thryoid and the adrenals can have a direct effect on cerebral functions. Of the other members of the endocrine system we know almost nothing, but modern work of this nature has been eradicating this ancient concept of dualism which has been a detriment to psychiatry and medicine in general. The personality of the patient, his emotional tone, his hopes, fears and apprehensions, and, in fact, his entire psychic make-up cannot be neglected by the medical man of today, as has been all too frequently done in the past.

It is obviously impossible to go into details in a paper of this nature. The most that can be done, in conclusion, is to point out the general trend of advance that is being made at the present time: First, in the field of psychology; second, in mental hygiene; and, third, in education, Psychiatry today is entering a new era: it is in a more healthy and virile condition. It has definitely emancipated itself from the walls of the asylum, and has taken its rightful place in the realm of medicine in meeting the problems of daily life.

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EDITORIAL

A Novel Crime Cure

The American Psychiatric Association has received the report of the special committee on the legal aspects of psychiatry. The report is unique and revolutionary. It deals with crime and its prevention from a novel, startling, and wholly theoretical point of view. It throws into the discard all our preconceived opinions about crime. It would change the procedure of courts and our conceptions of the legal responsibility of the criminal to society. It defines responsibility as "ability to change one's conduct in response to the direction of certain painful impressions." It ignores the usual legal test of knowledge of right and wrong. It is not apparent that the definition of the committee is any more sound or lucid than the legal test now employed.

"The psychiatrists seek, not retributive punishment, but diagnosis and a scientific attempt at therapy." They balk at the terms "insanity and responsibility," and prefer to determine "whether his capabilities or his mental status is likely to render the offender dangerous to himself or others." This means that the idea of punishment is to be abandoned, and that the theorist is to ascertain whether the mental capacity of the offender renders him unable to avoid crime. In other words, they measure crime, not by the facts of the offense, but by the mental capacity of the offender. They make of him an automatic reflex who is not responsible for his actions, and, therefore, should not be punished. They would prefer to use "therapy," whatever that means, in this connection, in the hope that his inhibition may be stimulated by change of environment, occupational therapy and other social agents. Rasuli, when he assumed the throne in Abyssinia, found that a big negro with a long sword and a kettle of boiling oil so stimulated the inhibition of the offenders, that life and property in that country were safe for many years. We wonder if regarding crime as a "behavior disorder" is going to be as effective as the cruder method?

The creed of the committee is that crime is an adaptation failure, and is a psychiatric problem; that it can be studied and controlled; that such study can discover crime potentialities in people and can control them; that psychiatrists should be appointed by courts to investigate the mental status of the offender; that the terms "insanity" and "lunacy" be eliminated, and that the psychiatrist should be absolved from the necessity of pronouncing upon religious and legal terms in which he has no interest, such as "responsibility," "punishment" and "justice"; that psychiatrists have *authority* in their recommendations as to the disposition and treatment of the prisoner, and that permanent legal detention be inflicted upon the incurably inadequate, incompetent and antisocial, irrespective of the particular offense committed.

This creed is certainly revolutionary. It would take out of the consideration of the courts the facts of the offense, would abolish the present legal concept of responsibility and would give to a Doctor authority as to the disposition of a prisoner. It would give to him the right permanently to imprison any one whom the Doctor thought to be antisocial or incompetent. We are led to wonder by what revelation psychiatrists have become so omiscient. Have they solved the problem of

free will? Are they sure that man in relation to crime is only a reflex being? Do they want to disregard such legal commonplaces as justice and responsibility? Are they sure that they understand human nature and the needs of society better than courts and juries?

One can hardly imagine the courts turning over to a psychiatrist "Dutch" Anderson or Gerald Chapman, notorious criminals, for a study of their heredity, environment and adequacy to adjust themselves, and relying upon occupational therapy and other means to cure their criminal tendencies. Does the committee take itself so seriously as to believe for a moment that people would stand for such pseudo-scientific garbage? We would suggest that the committee withdraw its report and patiently await the time when science can find a rational etiology and cure for crime.

A Word for the Druggist

There has been a marked change in the retailing of drugs in recent years. A generation past the druggist was engaged only in the practice of pharmacy, skilled in the compounding of prescriptions, although many of them were of "shotgun" combinations. The prescriptions written by doctors today are much simpler than formerly, although in variety many times greater.

The development of the large pharmaceutical houses while simplifying the dispensing of many drugs and their combinations has frequently proven an expensive development. A detail man from a large pharmaceutical house visits the local physicians. Something with a new name which is perhaps nothing more than a new combination is called to the attention of the profession. A number of physicians are duly impressed and write some prescriptions embodying the new remedy. The prescriptions are necessarily presented to various drug stores and each druggist, if he does not substitute, and the presumption is that he does not, must obtain a stock of the new remedy from the wholesaler, well knowing that, as likely as not, he will not have further demand for that particular remedy. Therefore he is compelled to charge a sufficient amount for the single prescription to insure himself at least against loss through filling the prescription, knowing that the remainder of the stock bottle would probably stand idly on the shelf for perhaps years.

It is quite apparent that the medical profession is in some degree responsible for the cost of prescriptions when doctors are so easily impressed with the sales talk of the detail man.

Too often a doctor feels that he must prescribe every new drug or combination which is brought to his attention, or else be regarded as a back number. He must do a little original research work on his private patients and test new remedies. After all, the proven efficacious drugs are not so numerous and the conservative physician restricts himself to a few comparatively tried and true friends in the drug line.

The number of biological products is enormous and seems to be increasing daily. A large quantity of these products is being distributed in a more or less haphazard way by supply houses direct. It would seem that the dispensing of these products through the usual drug store channel would be in the interest of physician and patient in that such supplies be fresh and many have to be kept in a refrigerator.

There are, of course, other factors which make it difficult for the average druggist to earn a livelihood on the dispensing of drugs alone. These force him to add merchandising to his practice of pharmacy in order to make a success.

The pharmacist is entitled to a fair margin of profit on prescriptions filled. We do not know of any druggist who has become wealthy from the drug business. Too often, perhaps, we are inclined to side with the patient in criticism of charges for prescriptions without a full knowledge of the costs entering into this service. Closer investigation of the facts might well result in greater coöperation and harmony between members of our profession and the druggists in an attempt to render better service to the public.

The doctor should be broadly human. He must deal with the vagaries of age and the fancies of youth, the sports of boys and the appetites of men. In his profession he tests the aviator and rations the soldier, estimates the endurance of the laborer, cares for the worried mother and relieves the desk-ridden financier. His thought must reach to the ideals of the clergyman and interpret the flesh-prompted dreams of the man of the world. And in this service, neither the precision of science nor the efficiency of business methods will suffice, for above all else the practitioner must preserve and exercise the kindly indulgence of a considerate friend.—*Found among the papers of the late Dr. Edward Hickling Bradford.*

MISCELLANEOUS

MIDWAY HOSPITAL

Beautifully builded, completely equipped, and introducing features in hospital buildings never before used in the Northwest, the new $750,000 Midway Hospital in Saint Paul has been formally opened to service. Five thousand visitors were present at the two opening dates, one held on Saturday, July 10, as community day, and the second on Sunday, July 11th, as dedicatory day.



The new Midway Hospital in Saint Paul, now open for service.

While the hospital utilizes modern equipment and planning found in the institutions being built today, it has in addition departures from ordinary hospital construction which introduce new features and utilize new equipment. There perhaps has been no hospital built in the Northwest where the matter of efficiency and ease of operation has been given more attention, so that the hospital by its very arrangement and layout eliminates all possible waste motion and gives absolute control.

Perhaps most unusual is the layout of the building, the shape of a "Y" having been utilized. Although of this unusual shape the building still gives a very pleasing architectural feeling, being Gothic in its lines, with a central tower which is utilized for the operation of elevators. In all, the building likewise has an ecclesiastical feeling, this feature being introduced because the new hospital is to be operated under the direction of the Northwestern Baptist Hospital Association.

The use of this general form of layout has given control from the vertex of the "Y" to supervisor's on each floor, being located in this position to give complete vision of every door on the floor. The general offices likewise are at the vertex of the "Y," as is the covered ambulance entrance, which is another unusual feature, for the "Y" shape of the building allows for its location at the front of the building at the general offices and opening into the elevators.

When the final addition is completed forming the complete "Y" the arrangement will give sunlight in 75 per cent of the rooms, the other 25 per cent of the building being utilized for service rooms where sunlight is not an absolute necessity.

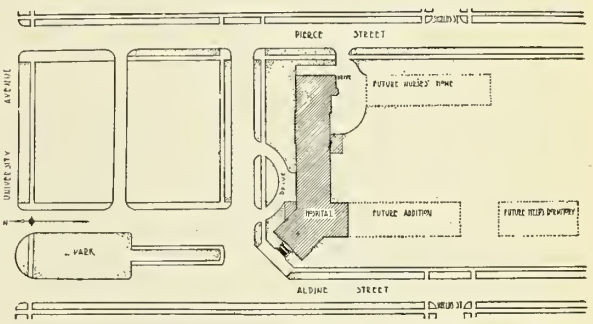
The entire top floor of the building is given over to the operating suite and its accessory departments. There are four operating rooms, each furnished in orchid-colored light-absorbing tile and complete in their equipment to the minutest detail. This suite has its own sterilizing room which opens into and which can be controlled from the nurses' work room adjoining. The hospital likewise has an emergency operating suite complete with its own operating room, sterilizing room and waiting room.

The microscopic and chemical laboratories have likewise been located on this floor with easy access to the operating suite, as has the x-ray department.

The third floor, which has been utilized as an obstetrical and children's floor. likewise has new features. There are two delivery rooms each furnished in the same orchid tile as used in the operating suite and complete with their own sterilizing department which is independent of the sterilizing equipment of the operating suite. The entire floor including the nursery has soundproofed walls and ceilings and double doors have been used so that sounds from all rooms on this floor will not be transmitted to any other portion of the building.

A steam heated work table has been provided for the nursery, which has its own service department and is a complete unit in itself.

On this floor, as on all others, again at the vertex of the "Y," has been located a service room which is



Plot plan, showing location and layout of new hospital, with arrangement of additions.

connected with the main diet kitchen by automatic tray elevators. There are no diet kitchens on any of the floors, but the foods will all be served in the main diet kitchen and taken by automatic elevators to each of the service rooms for the patients.

The food service has been so planned that there is no crossing or retrogression in the route of the foods from their receipt at the delivery entrance until they are served in the diet kitchen. Preparatory rooms, refrigerators, the main kitchen and diet kitchen have been so arranged as to make this possible.

The second and first floors have been utilized for patients' rooms and for nurses' quarters. There are one, two, three, and four-bed rooms, but no wards. Each room is furnished in steel furniture, has its own radio plug and the floors are of terrazzo with halls inlaided in rubber. Many of the rooms are provided with telephones. The present structure will house 100 patients and the nurses.

The laundry has been made an integral part of the

building, although it has been constructed on its own foundation so that vibrations will not be transmitted to the structure proper.

All departments of the building have been so erected and planned that they will be sufficient to care for the requirements when the final addition is completed. The addition, therefore, will be given over entirely to additional patients' rooms. Included in the plans likewise is a nurses' home which is to be erected as soon as the occasion requires.

Patients from the old Midway Hospital were moved on July 20th. The old hospital is to be utilized as a home for maids.

The hospital will be conducted under the auspices of the Northwestern Baptist Hospital Association, of which Dr. George Earl is President. Dr. Robert Earl is Chairman of the Board of Directors and has also been Chairman of the Building Committee. Physicians and surgeons who have been associated with the old Midway and the old Merriam Park Hospital, which was destroyed by fire about a year ago, will form the nucleus of the staff for the new Midway. From this nucleus the staff is to be gradually increased.

OBITUARY

Dr. Henry C. Stuhr

Henry Christopher Stuhr was born at Frontenac, Minnesota, September 28, 1874. His parents were Carsten and Else Rokke Stuhr, natives of Germany. They had four other children, Peter Stuhr, of Euclid; Mrs. Anna Giese, of East Grand Forks; Mrs. K. Lemieux, of Red Lake Falls, and Dr. John Stuhr, who is now practicing medicine in Stillwater. Dr. Stuhr married Susan Easton, who still lives in Minneapolis, and they had one son, Easton Stuhr, a student at Carleton College.

Dr. Stuhr graduated from the Medical School of the University of Minnesota in 1900, took his interneship in the City and County Hospital of Saint Paul, and did postgraduate work in surgery in Vienna for two and one-half years, from 1905 to 1907.

He practiced in Argyle, Minnesota, until 1912 and came to Minneapolis in 1918, where he became associated with Dr. A. T. Mann in the practice of surgery. He was on the surgical staff of the University of Minnesota for several years, and at the time of his death was a staff member of the Northwestern Hospital, the Wells Memorial Dispensary, and the St. Barnabas Hospital, where he was chief of staff.

Dr. Stuhr was formerly a member of the Marshall County Medical Association, and at the time of his death was a member of the Hennepin County Medical Association, Minnesota State Medical Association and of the American College of Surgeons.

He held a membership in the Minneapolis Athletic Club and was a Thirty-Second Degree Mason and Shriner. He was on the Board of Directors of the Minneapolis Clinical Association.

On the morning of June 6, 1926, when returning from a call, his car was wrecked and he was found dead a few minutes later by a passing motorist.

His funeral services were conducted by the Scottish Rite Masons at Lakewood Chapel on June 8, 1926.

Dr. Stuhr's life was characterized by an unusual degree of fidelity and honesty. His quiet, unassuming manner made it possible for a casual acquaintance to miss the remarkable worth of his character. But those who knew him as a physician, as a fellow worker in organizations, or as a fellow practitioner, felt the gradually increasing value of his wisdom, his honesty and his stability, and his is a personality that has enriched in a singular way the lives of those who knew and trusted the kindly, gentle, dependable, and in all ways genuinely lovable Henry Stuhr.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

INTER-STATE POST GRADUATE ASSEMBLY

The annual meeting of the Inter-State Post Graduate Assembly of North America (formerly the Tri-State Medical Society) will be held in Cleveland, Ohio, October 18 to 22, 1926. The general headquarters for the scientific session and exhibits will be at the Municipal Auditorium. The Hotel Cleveland will serve as hotel headquarters. For two days preceding the Assembly clinics will be held in the hospitals of Cleveland.

The tentative program of the meeting has been announced. Besides an array of shining lights in the profession of North America, appear the names of Mueller, Doderlin, Sauerbruch and Lange, of Munich; Gurgel, of Rio de Janeiro; Carnot, of Paris; Fraser and Wilkie, of Edinburgh; Young, of Glasgow; Wheeler, of Dublin; Balint and von Koranyi, of Budapest; Simonena, of Madrid; Kostitch, of Belgrade; Tamini and Castex, of Buenos Aires; Alves de Lima, of Sao Paulo, Brazil; Horder, Paterson and Handley, of London; Haglund and Jacobaeus, of Stockholm; Wimmer, of Copenhagen; and Bull, of Oslo, Norway.

The clinics will begin at the usual hour of 7 a. m., and will occupy morning, afternoon and evening, terminating with a banquet on the evening of Friday, the fifth day. To those who attended last year's meeting in Saint Paul, nothing further need be said.

STEARNS-BENTON COUNTY MEDICAL SOCIETY

A joint meeting of the Stearns-Benton County Medical Society and the Wright County Medical Society was held July 29, at Tuelle's Resort on Clearwater Lake, Annandale. The program included the following papers:

Urology in General Practice—Dr. E. Klaveness, Monticello.

Cholecystography—Dr. M. J. Kern, St. Cloud.

Toxemia of Pregnancy—Dr. F. J. Schatz, St. Cloud.

Ocular Involvements Resulting from Sinus Infection—Dr. J. J. Gelz, St. Cloud.

Thursday, August 26, members of the Stearns-Benton County Medical Society were guests of Dr. P. C. Pilon at Paynesville.

OF GENERAL INTEREST

Dr. Richard N. Cranmer of Minneapolis has returned from a two months' trip abroad, during which time he visited England, France, Italy and Switzerland.

Dr. G. H. Walker, formerly of the Miller Clinic, Saint Paul, is now associated with the Winona Clinic, Winona, Minnesota.

Dr. Werner W. Hempstead, son of Dr. and Mrs. Werner Hempstead, of St. Cloud, and Miss Rose Meyer of Melrose, Minnesota, are to be married in September.

The wedding of Dr. Charles Blumer, of Minneapolis, to Miss Erma Rischmiller, of that city, took place Saturday, August 14, at the home of the bride's parents.

Dr. E. A. French is reported to have sold his practice at Plainview to Dr. William R. Loney of Minneapolis. Dr. French and his family are now in the West, where Dr. French expects to locate this Fall.

Dr. and Mrs. George Elliott May, formerly of Wellesley Hills, Massachusetts, have recently arrived in Minneapolis, where they will make their home. Dr. May will be a member of the faculty in the medical school at the University of Minnesota.

Dr. and Mrs. C. A. Stewart, of Minneapolis, and Dr. and Mrs. R. I. Stewart, of Lindstrom, Minnesota, are in the East. They will visit New York, Philadelphia, Baltimore and Washington, D. C., before returning home some time this month.

The marriage of Miss May Morrissey of Antigo, Wisconsin, to Dr. Horatio B. Sweetser, Jr., of Minneapolis, was solemnized Wednesday, August 18, at St. John's Church in Antigo. Dr. and Mrs. Sweetser will make their home in Minneapolis.

Dr. and Mrs. N. H. Scheldrup, of Minneapolis, have announced the engagement of their daughter, Sylvia Louise, to Dr. Harold R. Leland, of Minneapolis, son of Dr. and Mrs. R. Leland of Kenyon, Minnesota. The wedding will take place in September.

More than 1,300 persons have received free vaccinations for diphtheria and scarlet fever at the clinics operated under the auspices of the Hennepin County Medical Society in conjunction with the Minneapolis health department.

The attention of our readers is called to the existence of the Arthur Home and Kindergarten for Blind Children, Pine Grove Avenue, Summit, New Jersey. The International Sunshine Department for Blind Babies has asked that anyone knowing of blind children needing care and education, report the fact to their headquarters, 96 Fifth Avenue, New York City. Minnesota makes some provision for the education and support of blind children which is recognized by the Arthur Home.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

ARMOUR & COMPANY
- Pituitary Liquid (Surgical)-Armour; Ampules Pituitary Liquid (Surgical)-Armour 1 c.c.

PARKE, DAVIS & COMPANY
- Pertussis Immunogen
- Pneumococcus Immunogen
- Silvol Dougies 5 Per Cent
- Silvol Ointment 5 Per Cent
- Vaginal Suppositories Silvol 5 Per Cent.

POWERS-WEIGHTMAN-ROSENGARTEN COMPANY
- Calcium Phosphate Tribasic-P W. R.
- Magnesium Phosphate Tribasic-P. W. R.

NONPROPRIETARY ARTICLES
- Tribasic Calcium Phosphate
- Tribasic Magnesium Phosphate.

LEDERLE ANTITOXIN LABORATORIES:
- Pituitary Extract-Lederle 20 Units.

H. A. METZ LABORATORIES, INC.:
- Oscodal.
  - Oscodal Tablets 2 Gm.

H. K. MULFORD COMPANY:
- Erysipelas Streptococcus Antitoxin-Mulford.

TRUTH ABOUT MEDICINES

Isacen.—Diacetyldioxyphenylisatin. The diacetyl derivative of dihydroxyphenylisatin. Isacen passes through the stomach unchanged: when it reaches the intestine, a gradual splitting off of dioxyphenylisatin takes place under the influence of the alkaline content of the intestine. The dioxyphenylisatin thus produced is stated to be non-toxic, not to be absorbed, and to be excreted entirely through the feces. Isacen acts as a laxative or purgative, depending on the dosage employed. It is supplied in the form of tablets, containing 0.005 Gm. Hoffman-LaRoche Chemical Works, New York. (Jour. A. M. A., June 5, 1926, p. 1769).

Pneumococcus Immunogen.—A bacterial antigen, obtained by agitating live pneumococci (Types I, II and III) with physiological solution of sodium chloride and separating the liquid from the organisms; the extract is free or nearly free from bacterial cells and toxin. There is some evidence that this material will yield approximately the same results as the ordinary pneumococcus vaccine (New and Non-official Remedies, 1925, p. 355). The product is marketed in 10 c.c. vials. Parke, Davis & Co., Detroit. (Jour. A. M. A., June 19, 1926, p. 1911).

Tribasic Calcium Phosphate.—Tertiary Calcium Phosphate. Tribasic calcium phosphate contains approximately 85 per cent of $Ca_3(PO_4)_2$. It has been proposed for use as an antacid. It has the advantage over alkaline hydroxides, such as magnesium hydroxide, and alkali carbonates, such as sodium bicarbonate, in that, being insoluble, it neutralizes the excess of acid in the stomach but does not produce systemic alkalization. It has been claimed that tribasic calcium phosphate is somewhat constipating.

Calcium Phosphate Tribasic-P.W.R.—A brand of tribasic calcium phosphate-N.N.R. Powers-Weightman-Rosengarten Co., Philadelphia.

Tribasic Magnesium Phosphate.—Tertiary Magnesium Phosphate. Tribasic magnesium phosphate contains approximately 70 per cent $Mg_3(PO_4)_2$. Tribasic magnesium phosphate has been proposed for use as an antacid: It has the advantage over alkali hydroxides, such as magnesium hydroxide, and alkali carbonates, such as sodium bicarbonate, in that, being insoluble, it neutralizes the excess of acid in the stomach but does not produce systemic alkalization. It has been claimed that tribasic magnesium phosphate has a laxative action.

Magnesium Phosphate-P.W.R.—A brand of tribasic magnesium phosphate-N.N.R. Powers-Weightman-Rosengarten Co., Philadelphia.

Silvol Bougies 5 Per Cent.—Bougies weighing 0.81 gm. and containing silvol (New and Non-official Remedies, 1926, p. 373) 5 per cent in a base composed of oil of theobroma, wool fat, white wax, acacia and glucose. Parke, Davis & Co., Detroit.

Silvol Ointment 5 Per Cent.—An ointment containing silvol (New and Non-official Remedies, 1926, p. 373), 5 per cent, in a base composed of petrolatum, wool fat, benzoinated lard and white wax. Parke, Davis & Co., Detroit.

Vaginal Suppositories Silvol 5 Per Cent.—Suppositories weighing 8.45 gm. and containing silvol (New and Non-official Remedies, 1926, p. 373) 5 per cent, in a base composed of gelatin and glycerin. Parke, Davis & Co., Detroit. (Jour. A. M. A., July 10, 1926, p. 99.)

Pituitary Liquid (Surgical)-Armour. — A slightly acid, aqueous solution containing the water-soluble principle or principles of the fresh posterior lobe of the pituitary body of cattle, free from preservative. It is standardized to have twice the strength of solution of pituitary, U. S. P. X. For a discussion of the action, uses and dosage, see New and Non-official Remedies, 1926, pp. 281-283. The product is supplied in 1 c.c. ampules. Armour & Co., Chicago.

Tetrabromophenolphthalein Sodium Salt-Eastman.—A brand of tetbrophthalein sodium-N.N.R. (formerly called tetrabromophthalein sodium; New and Non-official Remedies, 1926, p. 162). Eastman Kodak Co., Rochester, N. Y.

Tetraiodophenlophthalein Sodium Salt-Eastman. — A brand of tetiothalein sodium-N.N.R. (formerly called tetraiodophthalein sodium; New and Non-official Remedies, 1926, p. 163). Eastman Kodak Co., Rochester, N. Y. (Jour. A. M. A., July 24, 1926, p. 245.)

PUBLIC HEALTH FIRST!

The city performs no function more vital and indispensable than the protection of the public health. Even safety from fire and violence is not more imperative.—*Syracuse Herald.*

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SURGERY

SUPERVISORS:

DONALD K. BACON,
LOWRY BLDG., ST. PAUL

VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

SARCOMA OF THE STOMACH: Charles E. Farr (Arch. of Surg., 13, 1, pp. 75-80). Sarcoma as opposed to carcinoma ranks low in the tumors of the gastric wall, remaining well under 5 per cent of the malignant conditions. Of the etiology nothing is known. The diagnosis is rarely made. The outstanding feature of a large number of cases is the symptomless development up to a certain stage, followed by rather pronounced symptoms suggestive of ulcer, and even perforation.

The author reports two cases, one of the round cell type and the other of the spindle cell type, the latter giving no clinical symptoms whatever until the day before operation. On the whole, the outlook in sarcoma of the stomach is fully as good as it is for carcinoma.

HAROLD E. SIMON, M.D.

GROWTH DISTURBANCE FOLLOWING RESECTION OF JOINTS: S. L. Haas (Arch. Surg., 13, 1, p. 56). The advisability for the resection of a joint in a growing individual with intact epiphyseal cartilage plates is the subject for as much discusssion today as it has been during the last century and a half. The first resection of the hip was performed in 1721; of the elbow, in 1758; and of the knee, about the same date. It was early recognized that resection of the knee in growing individuals interfered with the growth of the limb and the majority of surgeons have favored the more conservative treatment of joint disease in growing persons. This is especially so in the case of the knee joint in which the adjoining epiphysis is responsible for the greatest increase in length growth.

In order to get some definite data relative to interference with growth following resection of the knee joint, twelve experiments were performed on young growing rabbits. From these the author concludes that a careful resection of the knee joint, in which the entire articular cartilage and a thin layer of the adjoining

bone is removed, will cause practically no disturbance in length growth, but it is important not to injure the epiphyseal cartilage plate and to refrain from passing fixation sutures through the actively growing columns of cartilage cells. It is advisable not to strip up the soft parts too near to the epiphyseal plate because of the chance of injuring its blood supply.

HAROLD E. SIMON, M.D.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS

ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

THE UNDER-RESTED CHILD: Robert Ewart Ramsay, M.D. (Arch. of Ped., December, 1925.) The normal child plays hard, becomes tired, falls asleep easily, sleeps hard and long, awakes fresh, and begins the cycle over again with new vigor of mind and body. Many children, however, play strenuously but sleep poorly, awake fretful and peevish, and are goaded into activity more by their unhappy disposition than by a natural impulse. When this cycle is repeated often enough there results a condition conducive to bodily weakness, nervous irritability and general inefficiency. The natural cure for this condition is an increase of the time allotted for sleep and rest.

Of great importance are faulty dietary habits, such as eating between meals, use of sweets and stimulants, and lack of balance in the daily ration. Parental control, or lack of it, may even then turn the scale. There are certain well defined signs of the failure to secure adequate rest and recuperation, namely: first, failure to gain in weight; secondly, fatigue-posture; thirdly, irritability.

Children should be taught to rest quietly, with or without sleeping. Rest periods of twenty to thirty minutes with the body recumbent, clothing loose, abundant fresh air, and no means of amusement, have proved beneficial in the school and in the home.

The rule as to diet is the simple one of adjusting the food to the digestive power of the patient. As to tonics, whatever their place in stimulating adults, they have no place in the therapeutics of the under-rested child. In the increasing of weight in these children the greatest aid is rest, not food or medication. Fatigue-posture is a defect of carriage altogether inconsistent with the normal bearing of children. Its presence in a child should be a warning that the processes of disintegration are at work, that the needs for repair of waste, restoration of energy and building of new tissue are not being met.

This brings us to the third outstanding characteristic of these under-rested children, namely, irritability.

When we are confronted with one of these irritable children, we must begin first with rest. Moving picture shows, parties, picnics, games, all must be denied until the nervous system is quieted. Failure to obtain sufficient rest in an age so full of shocks and wonders is sufficient explanation for much which passes by the names of malnutrition and nervousness.

R. N. ANDREWS, M.D.

ACUTE INTUSSUSCEPTION IN CHILDREN: W. L. Harris, M.D. (Arch. of Ped., December, 1925.) Intussusception is the invagination of one portion of the intestine into another. The invagination is usually descending—in very rare cases it is ascending.

Acute intussusception is by far the most frequent abdominal emergency in infants. Any part of the intestinal tract may be involved, but the one most frequently seen in infants is in the ileocecal region. The patient, usually between four and twelve months of age, is taken suddenly ill with severe abdominal pain and this pain intermits and recurs at short and regular intervals. Accompanying this pain there is always vomiting, at first of the contents of the stomach and later only mucus or bile and still later there is only retching or gagging with the return of each pain. The child very soon becomes deathly pale and shows evidence of great shock and prostration and is completely knocked out. Very soon after the onset of the attack, the bowels move. At first the feces are discharged, but very soon the stools consist of mucus and clear red blood. The pulse becomes very rapid and weak, the temperature is usually subnormal or rarely over 99 unless late in an attack that has been overlooked.

A few hours after the initial onset there can usually be detected a decided mass or tumor in the abdomen. This can usually be felt to the left or right of the umbilicus, most frequently in the left iliac fossa. The finding of the tumor per rectum is not necessary for diagnosis, but an examination per rectum should always be made. The earlier the operation, the better the outlook in all cases.

R. N. ANDREWS, M.D.

RELATIONSHIP OF TUBERCULOSIS TO MALNUTRITION IN CHILDREN: Henry A. Reisman, M.D. (Arch. of Ped., December, 1925.) Incipient, latent, masked and juvenile tuberculous children are not necessarily underweight.

Incipient, latent, masked and juvenile tuberculosis is not an important cause of malnutrition.

There is not a greater incidence of tuberculosis among the malnourished children.

About 64 per cent of contact cases are infected with tuberculosis.

Tuberculosis will frequently be missed if one awaits the signal of malnutrition to suspect it.

R. N. ANDREWS, M.D.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

PHYSICIANS LICENSED AT THE JUNE 1926 EXAMINATION TO PRACTICE IN MINNESOTA

BY EXAMINATION

NAME	MEDICAL COLLEGE	ADDRESS
Alger, Leon James	U. of Minn. M.B. 1926	General Hospital, Minneapolis.
Braverman, Nathan J.	U. of Minn. M.B. 1926	814 E. 5th St., Duluth, Minn.
Bray, Robert Bassett	U. of Minn. M.B. 1926	510 Essex St. S.E., Minneapolis.
Buzzelle, Leonard Kinnicutt	U. of Minn. M.B. 1926	Glen Lake Sanitarium, Oak Terrace.
Cable, Morris L.	U. of Minn. M.B. 1926	808 Washington Ave. S.E., Minneapolis.
Chapman, Chas. Belson	U. of Minn. M.B. 1926	General Hospital, Minneapolis.
Creevy, Chas. Donald	U. of Minn. M.B. 1926	2022 Park Ave., Minneapolis.
Davis, Jay Conger	U. of Minn. M.B. 1926	611 6th St. S.E., Minneapolis.
Delavan, Philip Albert	U. of Minn. M.B. 1926	1819 Marshall, St. Paul.
Duff, Edwin Roy	Loyola, M.D. 1926	St. Mary's Hospital, Minneapolis.
Ericson, Russell Waldo	Jefferson, M.D. 1926	2615 Newton Ave. So., Minneapolis.
Fauth, Karl J.	U. of Iowa, M.D. 1925	Clarence, Iowa.
Fawcett, Arthur Maxwell	U. of Minn. M.B. 1926	General Hosptial, Minneapolis.
Flanagan, Harold Francis	U. of Minn. M.B. 1926	Wykoff, Minn.
Funk, Victor K.	U. of Minn. M.D. 1926	195 Macalester, St. Paul.
Hackett, Joseph Frank	U. of Mich. M.D. 1924	3028 Emerson Ave. So., Minneapolis.
Hartzell, John Berry	U. of Cin. M.D. 1925	General Hospital, Minneapolis.
Hillstrom, Harry Theodore	U. of Minn. M.B. 1926	2735 Aldrich, Minneapolis.
Johnson, Verner Paul	U. of Minn. M.B. 1926	904 30th Ave. So., Minneapolis.
Kasper, Kelvin Anthony	Jefferson, M.D. 1926	Faribault, Minn.
Kernkamp, Leila Myrtle	U. of Minn. M.B. 1926	Waseca, Minn.
Koepcke, Gerald Meinhardt	U. of Minn. M.B. 1925	General Hospital, Minneapolis.
Leef, Edward E.	U. of Minn. M.B. 1926	920 Essex St. S.E., Minneapolis.
Lenander, Mellvin Everett L.	U. of Minn. M.B. 1926	629 Washington Ave. S.E., Minneapolis.
Levine, Nauftoli Michael	U. of Minn. M.B. 1926	211 Harvard S.E., Minneapolis.
Levitt, George X.	U. of Minn. M.B. 1926	707 University Ave. S.E., Minneapolis.
Lindahl, Merlyn John	U. of Minn. M.B. 1926	714 Delaware St. S.E., Minneapolis.
Lodmell, Elmer Arthur	U. of Minn. M.B. 1926	3615 Clinton, Minneapolis.
Lund, Chester Albin E.	U. of Minn. M.B. 1926	1506 Park Ave., Minneapolis.
McJilton, Charles Earle J.	U. of Minn. M.B. 1926	St. Mary's Hospital, Minneapolis.
Nathanson, Harold	U. of Minn. M.B. 1926	801 Elwood,Minneapolis.
Nelson, Arthur E. J.	U. of Minn. M.B. 1926	Miller Hospital, St. Paul.
Nelson, Gordon Gilbert	U. of Minn. M.B. 1926	382 Lookout Place, St. Paul.
Nelson, Wallace Irving	U. of Minn. M.B. 1926	3443 11th Ave. So., Minneapolis.
Nolan, Lewis Earle	U. of Minn. M.B. 1926	Cass Lake, Minn.
O'Connor, Loren Jeremiah	St. Louis U. M.D. 1926	127 W. Delos, St. Paul, Minn.
O'Hara, Floyd J.	U. of Minn. M.B. 1926	1715 Hillside Ave., Minneapolis.
Ochsner, Harold Conrad	U. of Minn. M.B. 1926	551 Carroll, St. Paul.
Papermaster, Ellick Jacob	U. of Minn. M.B. 1926	412 Jay St., St. Paul.
Petter, Charles Kenneth	U. of Minn. M.B. 1926	Glen Lake Sanitarium, Oak Terrace.
Ravitch, Samuel J.	U. of Minn. M.B. 1926	3141 Dupont So., Minneapolis.
Ready, Ruth Nystrom	U. of Minn. M.B. 1926	737 E. 18th, Minneapolis.
Regan, John Francis	U. of Minn. M.B. 1926	General Hospital, Kansas City, Missouri.
Rice, Carlton Herman	U. of Minn. M.B. 1926	University Hospital, San Francisco, Cal.
Sagel, Jacob	U. of Minn. M.B. 1926	623 N. Fremont, Minneapolis.
Sommer, Arno W.	U. of Minn. M.B. 1926	911 E. 15th St., Minneapolis.
Stewart, Nelson Wells	U. of Minn. M.B. 1926	Mankato, Minn.
Strader, Ernest Lightfoot	Hospital College of Medicine, Louisville, Ky., M.D. 1902	Deerwood, Minn.
Strate, Gordon Edward	U. of Minn. M.B. 1926	657 McLean, St. Paul.
Swanson, Robert Ralph	U. of Minn. M.B. 1926	912 Franklin Terrace, Minneapolis.
Stomberg, Dwight Wm.	Jefferson, M.D. 1926	531 Walnut S.E., Minneapolis.
Tanzer, Harry Hyman	St. Louis U. M.D. 1926	1038 Irving No., Minneapolis.
Thompson, Harold Lincoln	Rush, M.D. 1924	General Hospital, Minneapolis.

Name	Medical College	Address
Warden, Mildred	U. of Minn. M.B. 1926	2112 So. Humboldt, Minneapolis.
Warner, James Jennings	U. of Minn. M.B. 1926	Brainerd, Minn.
Wellbrock, Wm. Louis Anton	Med. Coll., So. Car. M.D. 1920	Rochester, Minn.
Whitman, Winifred Gray	U. of Minn. M.B. 1926	1659 W. Minnehaha, St. Paul.
Williams, Henry Lane, Jr.	U. of Pa. M.D. 1924	Rochester, Minn.
Williams, Thos. Bertram	Stanford, M.D. 1925	Rochester, Minn.
Yater, Wallace Mason	Georgetown, M.D. 1921	Rochester, Minn.
Ylvisaker, Ragnvald S.	U. of Minn. M.B. 1926	1371 Portland, St. Paul.

BY RECIPROCITY

Butzer, John A.	Marquette, M.D. 1924	Mankato, Minn.
Florin, Alvin Christian	U. of Ill. M.D. 1926	732 8th Ave. So., Minneapolis.
Frederickson, Alice Crooks	Coll. Med. Evangelists, M.D. 1924	Morton, Minn.
Frederickson, Guy Uriah Yale	Coll. Med. Evangelists, M.D. 1924	Morton, Minn.
Grier, James Parkes	Northwestern, M.D. 1925	Rochester, Minn.
Hane, Richard Lincoln	Ohio State U. M.D. 1924	Rochester, Minn.
Henry, Martin Rudolph	U. of Nebr. M.D. 1925	Cambridge, Minn.
Hotz, Edward Janus	U. of Iowa, M.D. 1925	Gaylord, Minn.
McCuskey, Chas. Fletcher	U. of Tenn. M.D. 1918	Rochester, Minn.
McDaniel, Samuel P.	Emory, M.D. 1916	Mt. Iron, Minn.
Martin, Clement Leon	Creighton, M.D. 1916	Rochester, Minn.
Olson, Carl Theodore	Rush, M.D. 1919	Wyndmere, N. D.
Reddick, Charles Edgar	U. of Louisville, M.D. 1924	Rochester, Minn.
Ryan, Carlton James	Marquette, M.D. 1925	Brainerd, Minn.
Wilson, Arthur Nash	Rush, M.D. 1925	Warroad, Minn.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

CLINICAL PEDIATRICS. John Lovett Morse, M.D., Professor of Pediatrics, Emeritus, Harvard Medical School; Consulting Physician at the Children's, Infants' and Floating Hospitals, Boston. Cloth, $9.00. 848 pages. Illus. Philadelphia and London: W. B. Saunders Company, 1926.

FUNDAMENTALS OF DERMATOLOGY. Alfred Schalek, M.D., Professor of Dermatology and Syphilology, University of Nebraska College of Medicine. 239 pages. Illus. Cloth, $3.00. Philadelphia and New York: Lea & Febiger Company, 1926.

APPRECIATION AND REMINISCENCES OF SIR WILLIAM OSLER, BART. Edited by Dr. Maude Abbott, McGill University, Montreal, Canada. 633 pages. 102 illustrations. Montreal: McGill University, 1926.

This book is, as the title suggests, a series of articles written by friends and associates of Sir William Osler, in an attempt to bring before those who have not personally known this great physician, an idea of his personality so that his spirit may still live, and continue to be an inspiration in the lives of countless physicians who are following in his footsteps. It is the aspiration of this work that the word "Osler" be not merely an empty term of historical interest, but rather an influence and inspiration that continues to leaven the lump of humanity in general and the medical profession in particular, even though his body rests as ashes among his beloved books at McGill.

The book is published under the auspices of, and in the form of, a Bulletin of the International Association of Medical Muscums. It is edited by Dr. Maude Abbott and represents to her, as well as to the many other contributors, a labor of love and an attempt to repay, in small measure at least, the great debt of encouragement and inspiration that they owe to his great personality. The work was made possible by a grant of five hundred dollars from the National Research Council of Washington and generous initial contributions from individuals, approached through the International Association of Medical Museums. In April, 1926, fifteen hundred numbered copies were published as Bulletin No. IX of the International Association of Medical Museums, and were offered to the public. Since it is in the hands of no publisher there is no advertising campaign and knowledge of its existence and availability must go by word of mouth or by reviews.

It is a weighty volume of 633 pages, and consists of 102 illustrations and 119 articles, which are grouped according to the different periods of his life: Early Years (1849-1869), Montreal period (1870-1884), Philadelphia Period (1885-1889), Baltimore Period (1889-1905), and English Period (1905-1919). In addition to these are editorials, general articles, and articles written In Memoriam. The illustrations alonc make the

book valuable and include photographs of Sir William at all ages. But in the last pages is found the greatest contribution of all,—a complete bibliography of all of his printed articles. These are many hundred in number and cover so wide a field of bibliography, the history of medicine and the practice of medicine, that it seems incredible that they are the product of one human brain. Besides this there is another rich bibliography concerning the writings about Sir William Osler, and this in future years will prove of inestimable value to the historian and may, as Dr. Abbott says, "help to keep the torch of memory aglow."

This book will be a valuable addition to the shelves of any library but will have an added value among the volumes owned or read by physicians or medical students. It presents a different point of view than does "The Life of Sir William Osler," by Harvey Cushing, for while that follows the golden thread of his life and shows him in all the glory of his vivid and lovable personality, as the ideal physician, this volume better emphasizes his professional life with his great achievements and honors, and by means of the carefully compiled bibliographies presents accurate data for those of the future who would inform themselves first hand. So each work occupies its own position and each contributes its own share, but if at certain points they do overlap, it merely serves to emphasize the great characteristics and accomplishments of one whose philosophy of life was summed up in his own words: "To have strived, to have made an effort, to have been true to certain ideals,—these alone are worth the struggle."

MARGARET WARWICK, M.D.

ALLERGY, ASTHMA, HAY FEVER, URTICARIA AND ALLIED MANIFESTATIONS OF REACTION. William W. Duke, Ph.B., M.D., Kansas City. 339 pages. 75 illustrations. Cloth, $5.50. St. Louis, C. V. Mosby Co., 1925.

The term "allergy" in this book is used in a broad sense which covers various manifestations related to each other to some extent. It covers the words anaphylaxis, serum sickness, protein sensitization, atopy, etc.

It shows how individuals can apparently become hypersensitive directly or indirectly to all or almost any alien agent, including foods, drugs, pollens, air, feathers, smoke, vapors, volatile oils, sera infections, physical agents, etc.

This book is divided into two parts, the first of which deals with specific hypersensitiveness to material agents, and the second to physical agents such as light, heat, cold, or mechanical irritation. The matter of nasal defects is gone into very thoroughly.

Some of the conclusions are that allergy may be a primary or contributory factor in (1) hypertension and hypotension, (2) in the pathogenesis of nasal polyps and chronic nasal sinus infection, (3) that it gives a relative immunity to chronic infections such as syphilis and tuberculosis and (4) it plays a rôle in cases of obesity and achylia gastrica.

The chapter on contact reaction caused by light, heat, cold, and mechanical irritants is new and is very definitely proven.

The contents of the book are very nicely arranged and easily read and should be of equal interest to the internist, general practitioner and rhinologist.

K. C. WOLD, M.D.

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EXPERIENCED STENOGRAPHER desires change. Familiar with clinical and clerical records and collection work of Clinic and Hospital. Address C-91, care MINNESOTA MEDICINE.

LOCATION OPEN for Catholic physician in Central Minnesota town of 2,500. Address C-93, care MINNESOTA MEDICINE.

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Short Course For

GENERAL PRACTITIONERS

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THE DEGENERATIVE DISEASES AND PERIODIC HEALTH EXAMINATIONS*

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To many the term "degenerative diseases" implies arteriosclerosis and its results, while periodic examination of the apparently healthy means periodic cursory examinations of their anatomy, analogous in many ways to the regular overhaulings to which they subject their automobiles. To the public also this campaign by the American Medical Association in favor of periodic examinations would seem, tacitly at least, to promise that by such measures we may hope to lengthen a span of life to even 150 years, as one recent writer expressed it. Would that the questions we now are considering were as easy as this. Unfortunately the degenerative diseases are not merely sclerosis of the myocardium, kidneys, arterial walls, etc.; unfortunately also these diseases cannot be ascribed solely to bad tonsils, bad teeth and infected nasal sinuses; unfortunately periodic examinations to be of value must take into account far more than a person's blood pressure the sounds of his heart and the condition of his secretions; and still more unfortunately we have as yet no grounds for believing that we can offer our patients more than three score years and ten or perchance four score years. What this movement does promise, however, and this is most important, is that we can help a much larger percentage of the babies born to reach four score of years and to reach it with health normal for each successive decade and not as crippled invalids. In other words we cannot confidently assert that the reason men die at eighty is because of degenerative diseases: but we have reason to assert that the reason many do not reach eighty is because of degenerative diseases and that the reason so many who do reach eighty have little pleasure in life also is because of these same diseases. Whether or not to increase the percentage of babies who will live four score years will of itself increase the number of those who will reach ninety, only time can tell. The evidence in favor of it, however, is now not very promising, as we shall see later. One thing is definite—our profession has no more moral right to sell the public sky blue securities in that realm of hope than bankers have to sell them financial paper resting on an equally inadequate basis of fact. The present campaign is splendid in its conception and worthy of the enthusiastic support of our profession but before undertaking it we should face frankly the many and great difficulties which it presents, otherwise we may not only fail, but discredit the movement and ourselves its sponsers in the eyes of the public, the beneficiaries of this campaign. Health unfortunately can seldom be gained at the price of a few local operations; diseases are the resultants of many and very diverse factors; and the degenerative diseases are perhaps the most complex problems which our profession is called upon to treat.

The diseases of childhood are for the most part acute infections of short duration, usually stormy in character, with very definite characteristics, and which, if survived, seem usually to lead to perfect recovery. The degenerative diseases of middle life, on the other hand, creep on insidiously, often make their presence known to the patient only after years of silent progress, and, once started, seem to progress steadily for few or many years, crippling their victims more and more, and finally, unless forestalled by some more acute illness or by an accident, determining his death. What these diseases really are is not an easy question to answer. The patient knows them chiefly because of the weaknesses they produce, and what we physicians usually demonstrate is not the disease itself but evidences of

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its healing; for the placques which harden the arterial walls, the sclerosis of kidney, liver, and heart, are only nature's beneficial attempts to repair damage. What are these slow silent aggressive lesions which so insidiously creep on? When do they start and why? Can we by periodic routine examinations detect them early in persons who believe themselves quite well? Grant that we do detect them early, can we then stop them? That is the subject of this paper.

In southern Indiana is a point of interest to tourists, the Lost River, a fairly large stream which at one spot wells out of the ground. Its source is not visible, and yet we know that for miles around various smaller streams flowing under the ground are uniting finally to emerge as this river. So it is throughout life, many a physical defect, many an illness which seems suddenly to interrupt a period of perfect health, are simply lost rivers, the sources of which are back in childhood, back even in prenatal life. The child may seem to recover entirely from its acute illness but only too often a latent infection is left behind, and this later, like Lost River, wells up in the midst of a period of apparently good health. These latent infections cannot be harmless. They must injure. Some seem to favor the persistence of a juvenile habitus. Some influence in some degree the development of, or the future functional power of, our internal organs. Some determine in some degree the individual's future susceptibility to disease and his resistance to injuries both physical and mental, while some explain the chronic diseases of heart, lungs, kidneys and joints which cripple the individual when he needs his best strength. It would seem proven that the younger the child the more serious the effects of these latent diseases. This is especially true of those disturbances which succeed in crossing the placenta barrier from mother to the unborn child, and of the acute infections of infancy. It is these which explain probably not a few of those mental and physical defects which first become evident later, and which usually are labelled by eugenists as "congenital" or "inherited." It is claimed with good reason that if we can protect the child during the first ten years of his life from the so-called diseases of childhood and their complications that we shall have forestalled the majority of the diseases of young adult life; that is, that the diseases of the young adult are in large measure lost rivers whose sources were in early childhood, and the majority of them preventable. A good illustration of this is tuberculosis, a disease which in the majority of cases takes up its abode in the child's body before he is ten years of age but which may give no clear hint of its presence until ten years later. We can hardly doubt however that during this second decade the rapidity of the child's growth, his general robustness, his resistance to other diseases and even his general mental attitude toward play, study, yes even toward religion, are in some degree influenced by this latent tuberculosis. Again, there is good reason for the belief that if we can protect the child during the first ten years of his age from any injury to his kidneys, that we shall have insured until middle age his kidneys against all but the most serious troubles; and the same is in some measure true of various diseases of the heart, joints, and other organs, that they could not have developed in young adult life if they had not started in early childhood. There is good reason, therefore, for the belief that periodic health examinations should be of the child rather than of the adult.

After a person reaches middle life, however, another set of diseases seems to make its appearance; some acute, others more chronic; and yet the majority of these so-called diseases are not diseases but are symptoms which reveal the weakness of injured organs. They may be likened to the limping of an organ so injured that if urged too far it may fail altogether. The silent inflammations which have crippled these organs may, for years, have smouldered on slowly destroying important tissue, while nature has industriously been at work building walls of scar tissue to strengthen weakened spots and to replace the wasted place. During these years, until the limp begins, the patient may be quite unconscious of his progressing injury; and yet it is inconceivable that his general attitude toward life should not have been determined in part at least by weaknesses of which he still is not clearly conscious.

In considering these diseases of long duration we would emphasize certain general truths; first, that although they may continue for ten, fifteen or twenty years, yet they are not due to causes which started them ten, fifteen or twenty years ago. The very fact that they have continued is adequate proof that a cause also has continued

and this today may be amenable to treatment. Human protoplasm has a remarkable resiliency and always tends toward the normal. For a disease to continue means that the cause also continues. Remove this cause, the present load, usually a focal infection, and the patient usually shows some improvement. To control these diseases of heart, lungs, kidneys, joints, etc. it is our custom to remove tonsils, pull teeth, drain nasal sinuses, remove gallbladders, cut out the appendix, perform various operations on the pelvis of both sexes, and, if these measures fail we mention constipation and a resulting intestinal autointoxication. Certainly we have good reason for these operations. The discovery of any latent infection is sufficient justification for periodic routine examinations. We should indeed operate more often than we do. A tonsil buried beneath adherent pillars may not have caused a sore throat for years and yet harbor serious infection. A devitalized tooth root bearing an artistic crown is not harmless since painless. The nasal sinuses may be infected even though the nose on inspection looks quite normal. Not nearly enough attention has been paid to the danger of infected tracheobronchial lymph glands and of chronically infected gallbladders which may give no local symptoms but which perhaps are more important in the causation of degenerative diseases than are the so often associated appendix lesions. These and other infections of long standing may be revealed by routine examinations and should be relieved, but to identify them with the degenerative diseases we now are studying is perhaps stressing too much the importance of an immediate cause and overlooking much more important lesions, lesions which like plow and harrow break up the ground so that germs otherwise impotent can take root. These plows and harrows of disease culture are the children's diseases already mentioned; latent lues; latent tuberculosis, etc.; for degenerative diseases are due in part to a primary infection, in part to a sequela which may persist for years (in tonsils, nasal sinus, gallbladders, etc.) and in part to the patient's whole makeup, emotional as well as physical.

The second point is this: that while the infant does enjoy an expectancy of life approximately fifteen years longer than did the infant of twenty-five years ago, yet to help the man of forty to increase his expectancy, preventive medicine, splendid though its results have been, must struggle against tremendous odds. Many of those who have no interest in modern medicine believe that this general improvement in health, for which we doctors claim the credit, is only one element of a general uplift of social conditions due to improvements, which includes the automobile, telephone, etc. This is far from the truth. While the so-called improvements of modern life have made life pleasanter and easier, yet they certainly also have tended definitely to shorten life, and the fact that the life expectancy of adults has not been definitely shortened (and some say it has been) is due to accurate research medicine and to this alone. For illustration, we count the advances in engineering which have led to city water supplies and other public utilities as great advances in civilization, but at first city water systems killed thousands by typhoid and other water borne infections, until medical men as bacteriologists devised practical methods of so sterilizing the water that it was safe and still potable. We easily remember when practically all food production was a local matter. Now, our morning's milk is gathered from hundreds of miles distant and our meats, vegetables, and fruits, from the end of the world. Without medical research the problems of food transportation, food refrigeration, food storage, and food distribution, could never have developed, and the modern city would have been impossible. Modern rapid transit has so increased the hazards on sea, on rail, on rubber tires, and also on foot, that it cannot be accused of lengthening life. A generation ago the majority of persons stayed at home in winter and during the winter kept early hours each night; they had nowhere to go, either for the season or for the evening. They, therefore, were well rested. But now, thanks to our ease of transportation, to our systems of modern lighting and of modern heating, we can make winter summer, and night day. Again, the opportunities for luxury in the business and social worlds have immensely increased the struggles of our life, but as yet no genius has invented a new model of nervous system which can develop power commensurate with the opportunities we have to spend it. Our foods now are purified to the point of danger, and our automobiles have made necessary exercise difficult, and on these depend

in great degree the greatly increased incidence of appendix and gallbladder troubles, so great that notwithstanding the splendid achievement of modern surgery, death from appendicitis is increasing steadily. Also, the acute respiratory diseases, complex though their etiology may be, yet increase in incidence and severity with the increasing density of population, and increased density of population is one of modern civilization's most marked characteristics. Notwithstanding this, however, the spread of a little knowledge concerning tuberculosis, all of it based on very accurate medical research work, has made our cities relatively safe against the inroads of tuberculosis. In short, we challenge our critics to point out one single detail in modern civilization which has tended to lengthen life. The fact is that apart from the contributions of medical science all tend to shorten it.

Third. Another element in the production of the degenerative diseases, often lost sight of in such discussion, is that we have industriously disturbed the balances in nature. Of course we have, and we intend to still more, but we should be ready to make the proper compensatory changes. For illustration, it is more than likely that the elimination of malaria has increased the late results of lues including general paresis. It is hard for us to remember that man arose in a world already occupied by bacteria, and has been able to survive by coming to biological balances with his environment, and these we cannot safely disturb. I wonder if we know what we mean when we talk in a blatant way of "eliminating diseases." Is this at all desirable? Has not our lease to live on this planet been the result of struggles which have given us the ability to survive against odds? What, for illustration, would be the result if, at the beginning of the football season, the coaches of the University of Minnesota were to instruct the football squads to be very careful not to get hurt, to avoid all practical games, indeed to stay away from the football field until the day of the great game against Wisconsin. Would that team win? No, it is by training and by practice games that an eleven gets into condition to win; and the more the victories and the fewer the accidents, evidence of the excellence of the coaching, so much stronger the team. So it is in life. We win fitness to live by conquering in many minor diseases, and so we acquire the ability to survive the harder ones. Of the majority of these victories we may be almost or quite unconscious and yet we gain biological strength through them. Introduce into a new race a disease new to them or which their ancestors have not experienced for generations, as measles in the South Sea islands, malaria in America, and tuberculosis in Africa, and these develops as epidemics with high mortality. Also you may remember Dr. Vaughn's studies of typhoid fever during the Spanish-American War, which showed clearly that the well and physically strong boys suffered much more severely, that is, were in this particular biologically weaker than those previously on the sick-list. And certainly you all know the fear for a very strong man who contracts pneumonia.

No, the slogan "to eliminate disease" is quite misleading. We must have our practice games to keep ourselves biologically fit. We should not, however, willingly enter too young children into these practice games of life, except by vaccination whenever possible, for vaccination is merely a practice game so staged that one gets a maximum of immunity, that is, of biological strength, with a minimum of danger. Those beyond fourteen years of life are much safer fighters. Of course, this opens up a very serious question relative to our public school system. We crowd into our buildings several hundred or even thousand children of different races, social groups, and families, and into one room scores whose ages seldom differ more than a few months. Do we protect them enough? Could any arrangement be more favorable for the spread of contagious diseases? For children over twelve years old this might be safe, but not for those under ten, unless medical inspection be much better organized than now. Many think that we are much like the soldier who, if he gets in the path of a bullet, gets hit and suffers an injury which depends more on the nature and speed of the bullet than on him. On the contrary, we are more like the duellist who selects his opponent and the date of the fray, gives up all other engagements on that date, and fights it out to win or to lose. So we do not get sick just because we happen to be exposed to a disease; the chances are that we are often exposed to it before we contract it. Nor if we do contract the disease is its severity due especially to the virulence of the germ; it depends far more on our susceptibility and to our resistance against that germ. What happens in

that when we are biologically ready and the germ is convenient we stage the fight, interestingly enough often clearing up for the time being minor ailments previously in the arena, and we fight this battle to a finish.

Fourth, it is not entirely theory that in the production of resistance to, or susceptibility to, disease our emotional life is important. It certainly is important in determining the degree of our reactions. In the production of high blood pressure, certainly, of diabetes of both varieties, and of certain disturbances of the thyroid gland our emotions may play a major and a primary role. In the production of the degenerative diseases the emotional states certainly are no small factor in determining the grade which these lesions may attain.

Our attack on the degenerative diseases is by definite reform of the individuals of today and by the education of the citizens of tomorrow. Of course, it may be ridiculously easy to tell a man just how he should live in order to get perfect health, but we should not expect too much from this. The citizen of today, no matter how much he may desire to please us, feels constrained to live up to the standards of the group in which he lives and works and places his physician in somewhat the same position as a certain prominent lawyer who was accused of using his talents, not in teaching his clients how to obey the law, but in showing them how to continue to break the laws and yet avoid punishment. So our patient asks us not how may he keep or gain good health but how may he continue to carry his load in life with as little injury as possible. By education, however, we do gradually and unconsciously modify the habits of a rising generation more than we realize. We seldom will get the credit; we sow the seed and each one reaps a harvest, assuming that he always had believed just what he then believes, and that any one with common sense would believe the same. I remember so well an address delivered in 1901 before a Club composed of educated women. The subject was tuberculosis, the open-air life, etc. At the conclusion the president sarcastically assured the speaker that while doubtless all of his audience enjoyed his address, yet that she was sure that every woman present had common sense enough to know that night air is poisonous and that the windows should be closed tightly each night. Now, largely the results of the campaign against tuberculosis, sleeping porches are quite the fad and the outdoor life is popular. Of course, very few give the medical profession any credit for that revolutionary change in our habits; each one accepts it as a matter of course, as a self-evident truth. Not long ago we read with interest the Journal of a society organized in hostility to our profession and were pleased to note how heartily one writer approved of certain rules of hygiene gained originally as the result of medical research. If we doctors continue to talk about better ways of living, more regular and simpler habits, we may be confident that the next generation will accept as axiomatic, as common sense, that which the present generation, now so deeply under the hypnotic spell of this age of inventions, frankly disregards.

Can we then, by the periodic examination of the healthy, save many from the inroads of these degenerative diseases, and if so, of what nature should these be? First, we must admit that these examinations will not help the man we examine as much as it will indirectly help the man of tomorrow. Second, the examination we make certainly should help the man, and yet we should not allow our decisions of today to convey to him any assurance of tomorrow, if he already has a degenerative disease, for sudden unexpected death will overtake enough of our patients to shake the faith of others. Third, a cursory examination of a few physical functions similar to the examinations usually made by life insurance examiners, will prove very unsatisfactory and would, we fear, bring the whole movement into disrepute. Our examination, to be of value, should include a study of the man's family history, a careful study of his habits, and especially of his emotional life; the tension under which he works, his habit of worry, his ability to play during a vacation; least of all the actual present condition of his vital organs. Some laboratory work may be necessary, but not much; some features of the examination could be turned over to associates, but not much. Such an examination takes an hour and a half (although the later examinations of this patient by the same doctor would of course be briefer), or as much time as three appendectomies or six tonsillec-

tomies. Who will be willing to make them? Will healthy persons be willing to pay a fee commensurate with the time? Is there not danger that the periodicity of the examination will tend to make it too mechanical? What we really need is a more constant and close association between the examiner and his patient. Why should a great organization like the American Medical Association need by propaganda to encourage such examinations? No propaganda has ever been necessary to interest the profession in any new operation which promised much less benefit to the community than do these examinations. Why at a recent meeting called by officials of the American Medical Association were we, the invited guests, informed that the examination of well individuals is totally different from examination of the sick; that the medical schools should offer special courses in this field; and that possibly it might be necessary to train a separate staff of health officials to render this service. Two points are evident: that physicians do not depend much on physical examinations when making diagnoses; and second, that our profession does not take much pleasure in rendering this service. Personally I feel that some responsibility does rest with the medical schools, but am confident that the lack of interest in this subject on the part of our graduates is a necessary, although unavoidable and transitory, phase of a splendid reform in American medical education. I refer to the fact that in our curriculm we stress the biological side of medicine far more than the personal.

But there is need of caution. The epoch-making discoveries of one generation impose on the next generation the responsibility of the practical applications of truths not well understood. There is therefore always danger that in our enthusiasm we may arouse hopes among the laity the realization of which is as yet impossible. If therefore there ever was a period when physicians should be conservative it is now, lest we spoil in advance a movement which means great happiness to future patients.

BEFSAL

Befsal is marketed under absurd and ludicrous claims. The claimed chemical composition of the product and the product itself both may be described as "crude." (Jour. A. M. A., Aug. 21, 1926, p. 608.)

FADS AND QUACKERY*

Morris Fishbein, M.D.
Editor, Journal American Medical Association.
Chicago

After the beautiful vaudeville which you have just had, beginning with the wonderful symphony on the work of the press, by Mr. Galt, with which I may say we are all beautifully attuned, agreeing with him far more than we disagree with him; following next with the lovely drama entitled "From Nine Months Before Birth to the Age of Eighty," presented by Dr. Emerson; passing then to the living pictures, we come to a performance which will be perhaps in the nature of a Tony Sarg presentation of marionettes, perhaps in the nature of acrobatic feats, possibly merely a puppet show.

Of all the nations in the world the United States is most afflicted with healers. I say "afflicted" because the term refers in a manner to "an illness," and our healers are perhaps a sort of illness of the country. An osteopath, for instance, was describing chiropractic. He said, "Chiropractic is a cancer growing out of osteopathy."

Quackery is not peculiar to medicine. A charlatan is a charlatan regardless of the profession in which he happens to work. There are charlatans in the newspaper business who are known by a certain chromatic designation—yellow, I believe. There are charlatans in the ministry of all creeds who secure their devoted followers by acrobatic performances, leaping upward and shouting to God and then shouting through the floor of the platform. There are charlatans also in the law, who tell their clients how to stay just outside of jail. There are charlatans within medicine and even within organized medicine. The great task of organized medicine today is not the combating of the peculiar fallacies of unusual cults which seize upon one, two or three million people. Our great task—one which we assume definitely, one which we do not disclaim in any manner—is the weeding out from among our own ranks of those men who operate within the law. A charlatan outside of jail or inside of organized medicine is a much more dangerous man than one inside of jail or outside of organ-

*Read before Medical Economics Meeting of the Minnesota State Medical Association, St. Paul, May 17, 1926.

ized medicine. Our first task and our great task is to rid ourselves of our own charlatans and to bring up the standard of medical practice to the highest possible point, until every man within the profession is trustworthy and competent.

The Cultist and Sectarian: A cultist, or a sectarian in healing, is one who, without regard to the established facts of science, departs on some single dogma, some single belief as to the causation and healing of disease, and promotes that belief with all of the enthusiasm of a divinely inspired fanatic, probably for monetary gain. Contrast with that the scientific physician who has had an education second to none: high school education, university education, four years of medical education and hospital internship, possibly adding two or three years of postgraduate study and fellowship study in an attempt to acquire a knowledge of modern medicine. For modern medicine today is a science based on all of the fundamental sciences, embracing everything that can be taken from chemistry, from physics, from biology, from zoology, from psychology, from sociology, from every one of these deep and abstract studies that have been torn by man from the mysterious and brought into the open. Everything from all of these sciences that can be applied in any way to the diagnosis or healing of human disease must be a part of the armamentarium of the modern physician. Contrast that course of study and the attempt to acquire this actual knowledge with the single elements in sectarian medicine, the idea that all disease is caused by some single conformation, some single sign or error of belief; that all disease can be cured by reversing the process. Couple with this the information that the schools of some cults spend two hours of study each day in modern salesmanship and advertising. Where does the advantage lie in disposing of the goods?

The cults sneer constantly about the "germ theory." This is a term that must be discarded by every man who makes any pretension whatever to intelligence above that of a moron. The term "germ theory" is absolutely false in itself, because an organism that is living and that multiplies within the human body always producing the same disease can hardly be called a theory. Among the first methods to be used in disabusing people of the idea that the germ is a theory is to let them know the manner in which the germ actually does bring about its effects.

A Cultist Dictionary: Not long ago I began work on a cultist dictionary. Beginning with the letter "A," I began carefully to search the telephone books and directories, the advertisements, and every other possible source that was available to find out exactly how many queer and assorted cults there were in this great land. I picked this country particularly because many foreign countries rather limit themselves in cults. Somehow, they lack the versatile imagination that comes with freedom and open prairies.

My first list embraced hundreds of cults of different varieties, whose methods are practiced not only on an unsuspecting public, but on a very credulous public, a public that is anxious to believe anything that it cannot understand. After all, when one thinks of the radio and the waves coming through the air, one can believe almost anything!

After I had selected a list of some one hundred and thirty-seven cults, I began to narrow the classifications, because I saw it was quite impossible ever to get a complete list. I decided to list them according to variety: the electric cults, the manipulative cults, the faith healing cults, the mental healing cults, the cults of adjustment, the water healing cults, the nature curists, and so on. The varieties are almost unlimited, because practically everything that anybody can do to anybody has been tried by some cultist for healing disease.

Consider the remarkable ingenuity of the man who can find a new one today. Actually he doesn't find a new one any more; he merely combines a few old ones. For instance, chiropractic is not, after all, a new conception. It is a hybrid between magnetic healing and osteopathy, because the real father of chiropractic, if one can call a man like that a father, was a man who had been a magnetic healer and then studied—if you can study it—osteopathy.

Naturally the first cult in a classification that begins with "A" and ends with "Z" was aerotherapy. I have no doubt that most of you never have heard of aerotherapy. Aero means air, and "aerotherapy" is hot air applied according to a definite system to heal all disease.

Then there is "autohemic therapy." It is the latest offspring of one L. D. Rogers of Chicago. L. D. Rogers is a glorious and uplifting soul who changes from cult to cult much as a mountain goat leaps from precipice to precipice. He has

been from time to time president of various associations of peculiar physicians. He has founded journals for the support of his assorted vagaries. In autohemic therapy, it is claimed, blood is taken from the arm, and the specimen subjected to some sort of manipulation; then something is put into the arm again. That is autohemic therapy; its slogan is "Without bugs or drugs." Anybody can understand that slogan, and L. D. Rogers knows that anybody can understand it; that is the reason he adopted it.

The science of "autology" was the discovery of a Chicago man named Moras, who conceived the idea of adapting the philosophy of life of Elbert Hubbard to the creation of a healing cult. Elbert Hubbard knew his people well. He knew how to attract them with all the flubdubbery of gingerbread that appeals to the average intellect. He knew how to reach the esthetic inclination that wants a leather book lying on the parlor table.

Moras established autology, the science of one's self. It emphasized purity; be pure in your thoughts, pure in what you eat and pure in what you drink. Elbert Hubbard was supposed to have written the motto that if a man makes a better mousetrap than his neighbor, the world will make a path to his door. In the case of Moras, it probably would be paraphrased: "If a man makes a better mousetrap than his neighbor he is likely to catch a great many mice." He caught his mice; then he developed delusions and was confined in the asylum.

I skip purposely over the late—but not too late—Albert Abrams, who conceived those magnificent electrical devices that put the blush of shame upon the brow of Goldberg, the eminent cartoonist. We all know the wonderful machines in which a block of ice drops on a spring board and makes a canary bird sing. The bird's breath blows out a light and starts a clipper going that cuts the hair. That was the type of device used by the eminent Abrams to snare the unwary. What a wise old man he was! He began properly in the science of medicine with a good degree from a good medical school; he knew sufficient medicine to qualify for a while as a teacher of pathology. He qualified, but the remuneration of teachers of pathology is not remarkable and never has been. Abrams was a man who appreciated remarkable remuneration. It was not long before he developed the science of spondylotherapy, consisting of rapping on the middle of the back until satisfied that something has happened. No doubt spondylotherapy was derived from osteopathy and chiropractic. Abrams formed the American Association of Spondylotherapists, and the American College of Spondylotherapy. The formation of self-constituted honorary colleges attracts men who want appendages after their names. That is one of the first signs of charlatans in all fields.

Albert Abrams brought the fish to his net. He brought them in by giving the idea that they were going to be the select few. He travelled about the country giving courses, but spondylotherapy wore out, because, after all, chiropractic is much more simple. Then Albert Abrams conceived electronic diagnosis, taking advantage of the fact that a little knowledge is a common thing. The science of physics was beginning to develop and people were beginning to read in newspapers about electrons. They read about these electric things, about the radio and about the waves passing through the air, and they began to think they knew about electricity. They knew just enough for a man like Abrams to fool them. The wires in the Abrams box never went anywhere; nothing happened except in the mind of the patient. Using the same system that made spondylotherapy remunerative, he developed a cult that was much more remunerative. What has happened to electronic diagnosis today? Outside of a few places in which an occasional practitioner bobs into the light, the entire number of practitioners of this peculiar cult, I am sure, today is only a few hundred in the whole United States. One of them, I have heard, has recently located in Minnesota and is so enterprising in his desire to aid humanity that he doesn't want his patients to be misled into other places. He sends his men out on trains to pick up persons seeking the Mayo Clinic. If Abrams had known about that he unquestionably would have made this man one of his heirs.

The modern cultist, who is a very shrewd individual, is far shrewder in self-promotion, perhaps, than the man who is trying to practice honest, scientific medicine. The latter is not ashamed to tell a patient sometimes that he does not exactly know what the cause of the illness may be. Abrams and his kind realized that the

patient always wants to know right away what the cause is and how soon he is going to be cured. And he also wants something done right away!

A new cult in California is autoscience. Autoscience consists of mental broadcasting, taught to the disciple who comes to the shrine of autoscience in San Francisco. The practitioner mentally broadcasts health to his patient. There is the terminology of radio, the newest thing. How long will it be before some other new discovery in science is used by some other charlatan in some entirely different manner?

In biodynamochromatic diagnosis, the patient sits facing east and colored lights are thrown upon him from the west. Then if the magnetic poles are correct for that day and for that particular hour of the day, something is wrong with him. That is approximately the basis of biodynamochromatic diagnosis. George Starr White is the prophet of biodynamochromatic diagnosis, and he has given great aid and comfort to the American Medical Liberty League. Recently that group of opponents to sound medical science has been going into each community where there is a campaign for pure milk, where there is a campaign for vaccination, where there is a campaign for anything that is sound and right in the science of public health, and distributing certain pamphlets written by this variegated color specialist, George Starr White. Strange that a man like that should have the name White. These pamphlets are distributed among farmers and among people who perhaps have not had educational advantages, to incite in them mad opposition against scientific procedures. Our only hope for overcoming that kind of propaganda is to use the best methods that modern practice offers for the education of the public. The press must aid and writers must be developed to write about scientific medicine in one-syllable words.

California particularly is the home of many of these cults, the stamping ground of cultism in America. This I lay to the fact that Irvin Cobb expressed better, perhaps, than any one else, when he said, "California is full of well-to-do artistocrats who have nothing to do but sit on the front porches of sanatoriums and listen to the hardening of their arteries." That is the type that particularly appeals to the charlatan. Possibly they really do not want to be healed; they want merely to be amused.

One of these cults was the chirothesians, not a combination of chiropody, chiropractic and the writing of a thesis, but merely a method of avoiding the medical practice laws.

Then there are the Christian philosophers, headed by Bishop Wilbert Casper. Before they went bankrupt there were placed definitely to their credit instances of deaths of mothers whom the practitioners had attempted to deliver of children with all of the weird necromancy and magic of the whirling dervish or a dancing Indian priest. When the bishop passed out of business financially, he left a moving picture called "The Kingdom of Human Hearts" as one of his assets, and he was being sued for $6,255 back salary by the actress who played the part of Faith. His other assets consisted of twelve collection boxes and twelve collection bottles—empty.

The Defensive Diet League of America was apparently founded on the idea that dentists are easier than doctors. Just why one should think that a group whose income depends on pulling teeth for its funds should be easier than doctors I do not know. Dentists were inspired, however with the belief that it was their special mission to tell people what to eat, and that the chief things they should eat were substances promoted by a dozen faddists. Lecturers went into various communities and secured places on the programs of women's clubs, where they preached the gospel of the diet league.

What is it that makes the cult successful, even for a while? In the beginning, medicine itself was not a science, but a system of faith healing. The priest was the physician, and he secured his results by inspiring in his people the belief that disease was a demon and that it was within his power to cast the demon out. The belief persisted for many years, even through the period of Hippocrates, of Galen, of Celsus and of all the great scientists of the Middle Ages who were discovering anatomy and recording the facts of physiology and pharmacology. But soon the priests themselves began to realize that there were certain virtues inherent in material things—that a certain drug would secure the same result every time. They found savages availing themselves of the drugs of the fruit and of the field for definite purposes. Thus quinine came to be used for malaria. When they found these things, the priests were too wise by far to let them pass unnoticed, because they saw no reason why material

things should not be aided by faith in the healing of disease.

Gradually as the various sciences developed, particularly the fundamental medical sciences, man began to apply new knowledge to disease. But even yet, not everything is known. The human being does not understand everything that goes on in life and in nature. Man has always had a fear of the mysterious and the unknown. Preying upon that fear, and utlizing it to the greatest advantage, systems of healing founded on faith and disregarding the material have grown and prospered. Mesmer, who developed animal magnetism, was one of the first to avail himself of this power of suggestion, the power over the mind of man, to create a healing cult. Old Dr. Phineas Quinby in New England knew mesmerism. Mary Baker Eddy when she became ill went to Phineas Quinby. About the same time there appeared August Schlatter, and many other faith healers. Here was the capitalization of the knowledge that faith may do wonders in some ways.

At the same time other healers applied to special systems the knowledge that health is inherent in the simple life. There developed the Kneipp cure, and deriving from that today is naturopathy. Such hokum as walking in the dew with bare feet while wearing a white robe is a snare that captures, while the eating of simple foods and the avoiding of all sorts of sophisticated food and drink produce some benefit.

Long before historical times, even in the days of legendary fame, came the knowledge that there is a peculiar virtue in the laying on of hands. A mental suggestion made at a distance has virtue of certain value, but a suggestion made with the laying on of hands has a much greater potency, particularly if the hands are laid on by a man of intense personality and with an uplifting voice and countenance. This laying on of hands must certainly have been capitalized by old Andrew Still, who founded osteopathy, and by D. D. Palmer, the magnetic healer who combined that hokum with osteopathy and called it chiropractic.

Cults grow by the application of principles like faith healing, by the laying on of hands, by emphasizing the mysteries of electricity or some other science. They grow under the guidance of some powerful charlatan or leader who, like as not, either believes himself divinely inspired or passes on to his followers the belief that he is divinely inspired.

Here are these very simple classes, but they reclassify into hundreds. From faith healing alone were derived Phineas Quinby, Mesmer and Mary Baker Eddy, New Thought, the Immanuel Movement, the Fire Baptized Holiness Association, the Holiness Society of West Virginia, the Metaphysical Healers, the Mind Curists, the Viticulturists, the Phrenopthists, the Esoteric Vibrationists, the Occultists, the Venopthists, the Psychic Scientists, Coueism, much of psychanalysis and most of psychotherapy.

What is faith healing in its actuality? The series of articles on religious healing already mentioned concluded that unquestionably there are cases of drug addiction, alcoholic addiction, of mental disturbance of one type or another, like hysteria, that are benefited and cured by religious healing and by faith healing. Scientific medicine may adapt these means, by which these results are secured, to known facts of anatomy and physiology, using them in the healing of disease as a science and not as a fraud.

In the city of Vancouver, a scientific commission was appointed not long since to investigate the results of a faith healing week in that community. That scientific commission spent money and time going to the homes of the persons who had announced themselves loudly as being cured, to find out what had happened to them. The committee succeeded in securing the names of 350 persons who were presumably cured by faith healing methods. The diseases included cancer, pyorrhea, epilepsy, bronchitis, neurasthenia, idiocy and some fifty-five others. Of all the patients, only five were so benefited at the end of six months that they might be called cured. Thirty-eight patients showed general improvement, but 212 of those declared cured after anointing were found unchanged, and seventeen were distinctly worse. Thirty-nine of the "cured" patients were dead after six months. Five of the persons anointed and four members of the families of the anointed persons were found in institutions for the insane. Of the five cases admittedly cured, all were in the group classified by some diagnosticians as nervous or mental diseases. They included a girl who stammered before and had not stammered since; a hysterical paralytic who merely had convinced herself that

she was paralyzed and was unconvinced after anointing; a confirmed invalid who enjoyed a variety of ill-health, including many ailments, but whose physicians called her hysterical; a man who had diagnosed his own condition as internal goiter, without consulting a physician, but who was called by his physicians a case of globus hystericus. Worst of all, many tragic cases were found of children declared cured but much worse due to neglect six months after the anointing. Such are invariably the results of scientific investigation of the claims of charlatans of one type or another.

All in all, human nature is essentially the same. Four thousand years ago there were unquestionably charlatans and unquestionably credulous believers to fall for what the charlatans told them. There are today in the United States more than a hundred varieties of quackery and cultism. With the laxity of our legislation, with the methods by which cults propagate in this country, with the fertility of invention that characterizes the American mind, ten years from today, if there are new discoveries in fundamental sciences, there will be cults founded on each of them, and at least ten million imbeciles who think they are smart enough to try them.

NAFTALAN NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Naftalan, according to the Ft. Dearborn Drug & Chemical Co., is manufactured by E. Stiewe, Magdeburg, Germany, and is "a preparation of Russian mineral oils containing about 4 per cent of soap, in the form of an ointment." The claims made for the preparation are closely similar to those which were formerly made in the exploitation of Ichthyol for various skin diseases. The Council found Naftalan unacceptable for New and Non-official Remedies because the information in regard to its composition is unsatisfactory and indefinite and because the therapeutic claims advanced for it are unwarranted. (Jour. A. M. A., Aug. 14, 1926, p. 509.)

SILVER PROTEIN PREPARATIONS

At the request of the Council of Pharmacy and Chemistry, the A. M. A. Chemical Laboratory examined the silver protein preparations that had been found acceptable for New and Non-official Remedies in order to determine whether or not they complied with the standards of the U. S. Pharmacopeia X. The Laboratory reports that all of the specimens of the silver protein preparations both mild (Argyrol type) and strong (Protargol type) described in New and Non-official Remedies were found to comply with the new U. S. Pharmacopeia standards for these preparations. (Jour. A. M. A., Aug. 7, 1926, p. 430.)

THE MEDICAL PROFESSION AND THE PRESS*

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By way of providing a text for this paper, I am going to relate an experience with some doctors. About a year ago I was invited to speak before a group of medical men. I happened to be first on the program, so when I had finished, I sat down to listen to the rest of it.

Among those who followed was a distinguished physician whose name, after the employment of this adjective, I am altogether too discreet to mention. This gentleman described for the Society a case which lately had come under his observation—that of a woman who had something very wrong with her head. The ordinary methods of diagnosis being without avail, the patient was sent to a hospital where, after due consultation, it was decided to operate. When the skull was opened, a large tumor was discovered in the brain and of course immediately removed.

It was an interesting story, told with a great wealth of detail, yet when it was finished it seemed, at least to a layman, to be incomplete. Something essential had been omitted. Various gentlemen in the audience rose to put queries and to comment upon the strange case, and I expected momentarily to hear one of them ask the question which was, so to speak, trembling on my lips, but none did so. After some thirty minutes of discussion I was about to conclude that my curiosity would have to remain unsatisfied, when a gentleman in the rear of the hall took the floor and said: "Doctor, what was the result of the operation?" Then came the missing bit of information: "The patient died on the operating table."

I relate this incident not to amuse you at the expense of your professional brethren, but to support the thesis that science sometimes requires the coöperation of the press, not merely for the purpose of translating science into English, but occasionally in order to reëstablish its sense of relative human values. Your achievements in solving the mysteries of the human body are at once the admiration and despair of the laity. The impenetrable reserve with which the processes of

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your laboratories are guarded is matched by the no less impenetrable language in which you are, with the greatest respect to Dr. Fishbein, accustomed to publish your conclusions. A press trained to answer the questions Who, What, When, Where and How, finds itself baffled and occasionally exasperated at your tendency to invert what it has been taught to consider the dramatic order of the human narrative. In which, of course, the press is entirely unreasonable. It has no greater right to expect you to know its craft than you have to expect it to know yours. Less perishable literature than newspapers, of course, owes much to medicine. William Osler's "Science and Immortality," for example, suggests that his name might well have been as great in letters as in medicine, but as respects the peculiar art of journalism I suspect that the rule of the shoemaker and his last is a safe one to follow. Medicine probably will have to entrust to the press the task of transmitting its current accomplishments to the common man; and if this assumption be correct, perhaps my mission this evening is to present for your consideration some of the necessities of the press in this connection, and to suggest, if I may, the way in which our joint adventure in public service may be carried out most effectively.

All worthy enterprises in coöperation, I take it, rest first of all upon the solid foundations of mutual understanding and mutual respect. So far, then, as medicine is concerned it must be prepared to grant what the press freely concedes to it—that we understand our job as well as medicine understands its own. I believe that we do. Ours is no juvenile among the professions. Two hundred years before Andreas Vesalius gave to the world his epochal work on anatomy, a newspaper was being published in Peking. Apostrophizing the newspaper recently, Thomas Hardy the great English poet and novelist, wrote:

"I too am old; in me appears
The history of a hundred years;
Empires', kings', captives' births and deaths,
Strange faiths and fleeting shibboleths;
Tragedy, comedy throng my page
Beyond all mummed on any stage;
Cold hearts beat hot; hot hearts beat cold,
And I beat on; yes; I am old.

Old enough, I trust, to have acquired a very definite technic, a valuable experience and some understanding of the outlines of its task; yet I have the impression that medicine does not always or even usually recognize this. The average physician, I find, is inclined to regard the newspaper with something very like distrust. There is, of course, a reason. The newspaper is so absolutely opposed in all its methods to the scientific calm of the laboratory, and so impatient of the delicate relation existing between doctor and patient, as to be well calculated to fill his soul with misgivings. It is, let us frankly admit, a hasty and possibly an irreverent thing. It is devoted very largely to the fields of action rather than those of contemplation and research. Its judgments of necessity must often be based upon intuition rather than precise knowledge. It is breathless, intrusive, emotional and noisy. Its language is of necessity the language of the common man rather than the scholar. It is inclined to refer to the streptococcus as a "bug" and to the victim of dementia præcox as a "nut." To the man of ordered scientific mind it must indeed seem to know nothing thoroughly.

Yet if the scientist is to deal with and through the press, and he must if he is to speak to mankind in mankind's familiar argot, it will be necessary for him to rid himself of his apprehensions and to recognize that, after all, there is a profound method in the newspaper's apparent madness. It is founded upon a study of the human mind and heart which I suspect has not been less thorough than your own of the human body. If it is hasty that is because its modern constituency insists upon haste. You may be willing to await an authoritative announcement with regard to a medical discovery, but we know that you expect us, nevertheless, to bring to your doorstep the hour-by-hour developments in Britain, four thousand miles away. If the press deals with the news of medicine as it deals with the news of the English strike, ask yourselves why. If it devotes itself to action rather than to contemplation that is because the history of the world, of which it is the daily recorder, is a history of action. If it is irreverent in the sense that it is inclined to discount pretensions in all fields, your own included, that is because experience has taught it to take most things with a grain of salt. If it is interested not at all in a clinical history, yet very deeply in its end, that is because its constituency demands the last chapter first. It is elemental

because the essential interests of the human family have changed very little in the past four thousand years, and, so far as my own observation goes, may be expected to change very little during the next four thousand. If, therefore, you are to avail yourselves of the opportunities offered by the press for communicating with mankind, your task is not to smash the newspaper's sorry scheme, and remould it into something nearer to your heart's desire, but to accept it as you find it, remembering always that it is under the compulsion not of perfection but of doing its job as skillfully, accurately and intelligently as it can within the limits of time that have been definitely fixed for it, and to the extent that its readers require that it go.

If you ask what I mean by coöperation I might answer by describing the relations which already exist between the press and other professions. It may apply to a mathematician for an opinion on the Einstein theory; it may go to an archeologist to inquire about the lost city of Ur; to a lawyer for guidance upon a constitutional question; to an engineer in the matter of building a bridge, or to a theologian upon a Biblical interpretation. But when it goes to the physician to ascertain, for example, whether there is any sound scientific basis for the theory that cancer is caused by a germ, it finds itself so frequently hedged about with provisos and conditions as to make the effort well nigh useless. I have reference, of course, to that canon of medicine which frowns upon professional advertising. This has apparently been construed to forbid not merely the insertion of a business card in the newspaper, but any newspaper reference to a particular physician. Frankly, the press does not understand how a great profession, dedicated to the service of suffering humanity, can reconcile this rôle with one in which private business rivalry apparently plays so important a part. It finds the problem the more incomprehensible since medicine has never hesitated to urge upon the press its duties to the public, nor, in this connection, to suggest the reform of its advertising business. The average newspaper man tends to think that a rule of professional conduct which sometimes appears to sacrifice the public interest to the private business of the physician is curiously out of harmony both with the realities of life and with the rôle of preceptor.

Perhaps I may make myself clearer with a case in point. Some years ago this community was visited by an epidemic which caused great public distress and apprehension. There was hereabouts a physician who had made a special study of the disease and whose opinion presumably was worth something to the people. Nearly a week of precious time was lost in an effort to break down his professional reserve—not because he was unwilling to give the information, for we have not found you entirely averse to public recognition, but because he was fearful of professional opinion if he should do so. Finally, however, he surrendered to the argument that, like Othello, he owed the state some service, and permitted the press to quote him on the subject. What was our astonishment and mortification later on to be told that the press had "fallen" for Dr. Blank's free advertising? My own feeling was that this gentleman had performed a public service for which he was entitled to the thanks of the community; but I am very sure, in view of his experience, that he will never do it again. Why is it that in the vastly important matter of public health and in the fulfillment of the physician's obligation to suffering mankind so narrow an interpretation of his code is permitted to hamper his usefulness?

I beg you to believe that I ask this question with the most profound admiration of your great calling, and with some understanding of your side of the problem. It would be strange if a doctor's son did not understand it. I know how important is the maintenance of your fine tradition, how fearful you are of the advantage which might be taken by charlatans of any relaxation of your code; and I shall certainly not have the temerity to do more than mention the matter as it affects the press and venture the hope that you will yourselves eventually find the solution. Some bold spirits among you already are leading the way. The newspaper writer on medical subjects is now a familiar figure. At present a method is being worked out by means of which it may be possible to use these men as consultants in news matters affecting the profession. But it will never be possible, so long as the question of health remains one of the most interesting and important of all human questions, for the practising physician to avoid contact with his local papers, and it ought to be possible for him to get

along with them with a minimum of friction and a maximum of usefulness to his community. It certainly ought to be possible for him to speak frankly and openly with them without bringing down upon his head the strictures of his colleagues.

I have spoken of this matter of reliable scientific news as if it were of some importance. Is it, after all? A few weeks ago I heard Secretary Hoover deliver an address to a group of newspaper men from 21 nations. He was speaking at the Bureau of Standards, which is the government's scientific testing ground, and he told us that science is not news. If he is right, then our discussion is academic. But is he right? I do not of course know what newspapers Mr. Hoover reads, but, knowing as I do the newspaper attitude towards scientific advance in all fields, his remark struck me as astonishing. The fact is, and I am sure you will bear me out, that the eagerness of the press to bring to its constituency the latest developments in the laboratory and the clinic is far more responsible for criticism of the newspaper than its sins of omission. The press is more frequently scolded by the scientist for dignifying announcements made without respectable authority than for ignoring them. Was the discovery of radium news? Was the invention of wireless news? Was the first flight of the airillinium news? Was Einstein's theory news? Was the Schick test for diphtheria news? Were the discoveries of Doctors Dick with respect to immunization against scarlet fever news? I enumerate only a few of the discoveries of my own time which became front page news, as the very best possible evidence that the press is not, as Mr. Hoover suggested, out of perspective in the field of science. It is in the maintenance of this perspective, so far as your own branch of science is concerned, that the press asks for your coöperation and your sympathy.

Probably there is no business in the world that receives so much good advice as ours. Everybody knows what the public wants, or perhaps what the public ought to be permitted to have. The press is told by those who insist that it bring news half way round the world and deliver it at their doorstep every morning and every evening, that it is hurried and superficial. It is expected to provide infallible judgments upon art; science, government, literature and economics, although it is in the hands of fallible mortals. Perhaps, even if this is at times trying, it is a good thing for us. It provides us with the valuable corrective of public criticism, and I suspect tends towards our improvement. We do not, therefore, complain; we ask only that our critics, yourselves among them, help us to do our job more accurately and intelligently year by year. We cannot be reformed until human nature itself is reformed; we cannot be made over, so far as your profession is concerned, into something approximating Dr. Fishbein's famous Journal; we are incorrigibly devoted to English words of one syllable and to the writing of the last chapter first. But if you will speak to us openly and frankly when we consult you in connection with questions in which we think the public has a legitimate interest, and remember, when we dramatize your cases, that the public will otherwise pay no attention to them whatever, I imagine that together we shall serve mankind more faithfully and efficiently than if we go our separate ways.

PREVENTIVE INOCULATION AGAINST RABIES

In the use of antirabic inoculation, there is no especial advantage in the use of the treatment requiring a considerable number of doses over that in which a smaller number are employed. Within recent years the killed virus has to a very considerable extent replaced the attenuated virus. A number of modifications of the Pasteur treatment are licensed by the Treasury Department and all are considered to be safe and effective. The duration of immunity in man after a series of antirabic injections is unknown, but it is generally advised that an exposure to rabies more than six months after a course of treatment should be followed by a new course of the prophylactic. (Jour A. M. A., Aug. 21, 1926, p. 607.)

THE GERMICIDAL PROPERTIES OF SOAP

The assertion that solutions of soap may exert germicidal effects is credited to Robert Koch. His assertion has not been generally accepted. The customary view is that the value of soap rests on its cleansing powers, that is, by its property of removing germs mechanically. Lately, however, it has been shown that soaps are destructive to many varieties of microörganisms. Thorough washing of the hands with ordinary soap will destrop any adhering diphtheria bacilli, streptococci and pneumococci. There are microörganisms that seem to be unaffected by the soaps of some of the fatty acids. Foreign substances interfere markedly with the germicidal action of soap. (Jour. A. M. A., July 3, 1926, p. 37.)

THE ENERGY OF LIGHT*

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The more one investigates cause and effect in the universe and the development of the world the more respect one has for those ancient people of Central America, Egypt, and other countries who worshipped the sun. We pass over their sacrificial efforts to appease the wrath of the sun and win his favor since they are in harmony with many religious cults, in which the sufferers are sustained by the glory of martyrdom. Modern wars of civilized man are more destructive without doubt; those who are the greatest leaders in destruction become heroes. Concerning our universe there is little doubt that Chamberlain's theory is most acceptable, and that the sun's planetary system (of which we are a part) came from a most ancient near-accident to old Sol when another star body passed near and encircled it, without actually touching it, and caused the immediate development of such great heat that a number of masses were thrown off from it. The planets and satellites of these gaseous masses, made round by rotation and gravity, have since been cooling, each according to its size, as an enormous period of time has passed since that occasion. Mars probably has now about the climate of New York City. The orbit of the earth is one year, while Neptune, so great is its orbit, has made the trip about the sun but eleven times since the birth of Christ.

Physicists, geologists and biologists have discussed the millions of years of time which have been required for the formation of the present stage of evolution and development much as if such eons were but minutes of the present. Sunlight has taken a comparatively short time to reach us, coming at the rate of 186,000 miles a second. It takes eight minutes and twenty seconds to make the trip of ninety-three million miles from the sun to the earth. Our sun is one of the smaller suns, that is, the stars emitting light, being more condensed than some which are larger. The earth, in comparison with the sun, would be but a grain of sand at twenty-three feet from it when the sun is represented by a tennis ball; the next nearest sun, another tennis ball, would be 1,100 miles away. Only three suns other than our own are within ten light years of the earth, and from the nearest of them it would take four and a half years for the light to come to us. The space separating our solar system from the other suns is very great, considering the difference in time for their light rays to reach us compared with those from our sun. In fact all life has been and is dependent on the sun as it goes on through the ages emitting radiant energy. Professor Russell says the sun will give satisfactory rays for another billion years, which relieves some of our worry. The heat rays from the sun are capable of being measured. It is giving off energy equivalent to the burning of billions of tons of coal each second, and we are getting only a small part of it. The heat received from the sun by the entire surface of the earth is equivalent to the burning of two million tons of coal every second. The heat from one hundred million of the stars (or suns) would not here raise the water in a thimble one degree in one hundred years. We have a universe, the bodies in which are slowly contracting, yet our earth that some think of as large for practical purposes is as much smaller as the rapidity of travel has increased in fifty years; a few decades ago it took weeks to sail to Europe but now it takes only a few days. On land we had the horse, then came the rails, and now the automobile. The earth rolls on at the same old speed and in just the degree that man's speed has developed in the last fifty or one hundred years actually to encompass it, just so much smaller may we consider our world and so much more interesting is it as we can visualize it in thought. Man has gradually come into control of the world's forces, principally by making use of the stored energy of the sun and its ever-present activity. The stored energy of the sun is in the form of coal which developed when a very different atmosphere existed, heavily charged with carbon, and giant rushes and masses of tropical growth, trees, ferns and grass, made enormous beds of deposits which, under pressure of layers of earth and rock, ultimately formed coal of various degrees of hardness. Lignite is half-formed coal produced when that age was passing, and peat, found in our northern marshes, the still less formed carbonaceous material of the present period. Such material, including wood,

*Read at the banquet of the Minnesota State Medical Association in St. Paul, Minnesota, Tuesday, May 18, 1926. Also read before the Franklin Institute, Philadelphia, January 28, 1926.

is capable of disorganization by fire, as it combines with oxygen. It thus gives up that heat in a short time which it has been a long time in acquiring from the sun, gives back its carbon to the air and its minerals as a residue of ash. Water-power or white coal represents the rapid action of the sun. The energy of the sun stored in water as it is lifted by evaporation is released in the falling rain and the flowing river and can be transformed at man's desire and under his control.

In America we have made the greatest use of the sun's energy, and man's industrial labor is now backed by over sixty horsepower. The marvelous imagination of Jules Verne vividly recorded in his novels has, in fact, been surpassed by train and automobile, by airship, and both on and beneath the sea. However, the smaller our world the greater is the interest taken in it and all that there is of life of every sort on earth. Our enjoyment of it comes from the sun.

Since the electronic theory was formulated, scientists have determined that our world is composed of thousands of combinations, 250,000 being known, of the ninety-two elements, with the first or lightest as hydrogen and the heaviest, uranium, number ninety-two. Of these elements ninety are now known and each of these elements drops into a pigeon-hole of numbered negative electrons or planets, so to speak, which compose its atom as a universe, and with positive electrons equal in number to its atomic weight, which as protons make up its nucleus or sun. As Rutherford says, the size of the atom is equal in extent to the maximal sized orbit of its negative electrons. It was Franklin who divided electric charges into positive and negative. To name them now they would be reversed. The fewer the movable electrons the more stable the material. The structure of the two missing elements is known, namely those numbered 85 and 87, but the actual substances are still elusive. Only ninety-two electrons may be held together and those of high numbers are slowly breaking up of themselves; thus uranium breaks up into lead and radium, which is one hundred times more active, or again radium disintegrates into other radioactive forms, A, B, and C, and helium and lead; others can be changed by knocking an atom of hydrogen, the master element, out of them with powerful *x*-ray radiant energy. The iron core of the earth's center approximates 4,000 miles in diameter and is thus eight times larger than the moon. It is true that by absorption we gradually accumulate more from the radiant energy of the sun's heat waves alone than we lose.

All material has its specific atomic structure, even its definite electronic chemical combinations with other elements. Living material has its own electronic combination and activity of structure which is not necessarily the same as the ordinary combination of such elements, but is after death, with loss of radiant energy. Life, then, is more or less electric and varyingly active, oxidative and chemical. Almost perfect acting cells are made chemically and resemble the living in some activities, especially in causing crystalline formation. Bacteria, ultra-microscopic, or larger and of molecular dimensions, may act as electrons of varying energy. Few, possibly 5 per cent, of the great mass of bacteria, which are the active living chemists of the world in nature, are destructive to living tissue. The most common forms of life in the sea are the bacteria engaged in forming limestone from the calcium in sea water. They work in sunlight and warmth now as in the Cambrian period of the world's history; in the strata laid down at that time the fossilized remains of the pre-Cambrian and Cambrian invertebrate life are held for our inspection.

It is but lately that we have appreciated radiant energy, although it is only about two hundred fifty years ago that the sunlight was first broken by Sir Isaac Newton's prisms into its bands of light from violet to red. The visible rays represent but a fraction of the spectrum. Now we know that the heat waves lie in the red and infra-red regions and next come the radio waves which are many meters long and then the alternating electric current with some waves many kilometers long. At the other end of the visible spectrum is violet and beyond the visible violet comes ultra-violet, then *x-ray* and radium rays with still shorter waves. The waves of the visible spectrum are measured by the millionth of millimeter length and run from about 400 to 800 millimicrons (violet to red, through the blue, green and yellow), or by the Ångström units (a ten-millionth of a millimeter) from approximately 4,000 to 8,000. Certain wave-lengths of ultra-violet rays are most important in stimulating the chlorophyl (which is the green of plant life), the hemoglobin of blood cells (which, in thin layers, is also green) and the photosensitive plate. The

ultra-violet is the most stimulating and is held by the tissues of the skin while shorter and longer waves at both ends of radiant energy pass through or are absorbed by the body. Thus red glass holds back all but the red waves of the light or visible spectrum and passes a considerable quantity of heat waves. Ultra-violet causes the cells of the skin to protect their nuclei rapidly by screening with melanin or the so-called tan of sunburn. Such rays lower blood pressure from 7 to 10 per cent, somewhat increase the oxygen of the blood and blood calcium, the activity of endocrine glands, and the storage of iodin by the thyroid. This is of great importance as the blood carries the same fourteen primary elements that good soil does for plant life. The ultra-violet increases vitamin A; in fact can develop it in linseed oil exposed to the ray. Cod-liver oil has a large amount of this vitamin. Thus the ultra-violet ray of the sun prevents and cures rickets, which is so prevalent among the children of Scotland with its fogs and clouds and smoky air, as it is approximately only for half the year that they have much chance with old Doctor Sunshine.

Fortunately man's ingenuity has developed the quartz glass (or fused quartz), which permits the ultra-violet ray to pass. Celluloid and paraffined gauze are also somewhat permeable to it, while common window-glass cuts out most of it. Thus the mercury-vapor quartz-lamp, or arc light with carbons combined with nickel, has a large amount of ultra-violet which can be used in the treatment of chronic diseases, especially tuberculosis of the lungs and joints. The greatest effect of ultra-violet from sunlight is obtained at midday as the rays pass through the thinnest layer of air over the earth. The long slanting rays of morning and afternoon are largely screened by the air, especially because of the average half-inch layer of water diffused in hygroscopic form throughout the air. Thus high mountain altitudes are used in order that such sun treatments shall be most effective, although ultra-violet treatments are of value for shorter periods in any place, and artificial ultra-violet light can be created where nature gives little or no aid with sunlight. The ultra-violet which can be transmitted through air covers one and one-half octaves of light radiation, and one of the most destructive bactericidal regions of ultra-violet light is just below the very limit of the solar spectrum, that is 2,800 to 2,900 Ångströms. The ultra-violet stimulates chemical reactions without heat, which would otherwise require great heat to accomplish.

Water with carbon dioxide gas bubbling through it can be made into a hydrocarbon derivative, formaldehyd, CH_2O, being formed by exposure to ultra-violet rays. Sugar is chemically but twelve parts of carbon with eleven of water. Sunlight acting on the chlorophyl of the leaf makes starch, $C_6H_{12}O_6$, while cellulose is formed by a loss of a molecule of water, as the leaf unloads its burden of starch to the tree trunk at night.

The first recorded use of light in medical treatment was at Margate in 1750, by Russell, who was stimulated to its use by watching the self treatment of diseased animals. Finsen, of Copenhagen, gave it prominence in 1893, in the so-called Finsen ray; later Bernhard, in 1902, repeated the work by the employment of sunlight in the mountains of Switzerland for pulmonary tuberculosis; and in 1904, at Leysin in Switzerland, Rollier, finding that the treatment of tuberculosis of the lungs by heliotherapy under the direction of Bernhard was generally successful, started its use for the cure of so-called surgical tuberculosis, that is tuberculosis of bones, joints, glands, intestine, peritoneum and sinuses. The method is not a cure-all, but used with judgment and care may give surprisingly beneficial results. Those whose skins do not readily tan do not do as well as those whose skin quickly forms its melanin protection of the cell nucleus. In commencing treatment, the feet are exposed for a few minutes for a day or two, in a few days the lower half of the legs, then later the legs to the knees, and ultimately the whole body. The time of day the skin is exposed makes a great difference, as that light which gives the quickest photographic action has the greatest healing power.

The ultra-violet rays are destructive to skin if used without care. Probably this chemical reaction which is concerned in the destructive effects of the sun's rays on the skin in severe sunburn with blistering, destruction of skin and fever, consists of the formation of formaldehyd in the skin.

Hematoporphyrin made from blood and injected into the blood of the Caucasian makes him sensitive to light and may cause death in the sunlight, although without effect in the dark. Phyloporphyrin is its vegetable counterpart from

certain foods like buckwheat; it causes local skin reactions in man and white-skinned animals when they are exposed to sunlight. When carefully used this produces no reaction, yet the effect of continued or repeated small doses is undoubtedly to develop resistance of the blood and tissue against some chronic and a few acute diseases.

The light of the ordinary incandescent bulb is due to a filament of carbon which is resistant to the passage of the current. The filament would burn up if oxygen were in the bulb, but it operates in a vacuum or a bulb partly filled with inert gas. Diathermy is a method of heating living tissues to a considerable depth by electric current (as in the case of the lamp) to a temperature much greater in the center of a joint or muscle than can be obtained by superficial treatment. This temperature is greater than many of the germs of disease can withstand, and the process is similar to the pasteurizing of milk for thirty minutes at a temperature between 140 and 145° F. Such treatments are very effective in certain acute and chronic inflammations of muscles and joints, especially those caused by bacteria, as many bacteria are active in but a small range of temperature.

The essential elements when volatilized at high temperatures emit characteristic radiations. The spectrum of the sun's rays shows that the same elements which make up our earth are also present in the sun and this fact is one of the proofs of the earth's origin. Scientists were twenty-seven years studying a special band in the sun's spectrum which they called helium before this element was finally found on earth. We now know that it can be produced by the disintegration of radioactive substances, and is found both in the earth and in the sun.

In a democracy the mass of the people are dependent on city officials for health protection. Seventy per cent of the people of this country are now residents of the city and their needs should not be based on the working necessities of the 30 per cent (the farmers) who are opposed to daylight saving. Those in the eastern portion more generally can be thankful to their officials who have established daylight saving, making it possible for the children to receive more sunshine, and for grown-ups to enjoy a long evening and more contact with nature.

Certainly enough is known concerning the action of light to stimulate the medical profession to a desire to know more concerning it, and I shall feel well repaid if I have stimulated a single individual to read about and investigate this fascinating subject.

THE NURSE, THE HOME, THE HOSPITAL, AND THE HEALTH SERVICE

"The nurse plays an essential part in organized public health work; she is indispensable in the teaching hospital. And just now she is a storm center. Discussion, animated, sometimes excited, busies itself with questions of her training, qualifications, fields of work, hours, pay, motives, attitude. Physicians complain that she is hard to lure to the bedsides of private patients, that she is too often overtrained in theory, unduly professionalized, lacking in practicality and docility. Families find fault with the amount of her salary, the limitation of her hours, and her unwillingness to lend a hand in domestic tasks. Few people of modest means can afford to have her at all.

"The hospitals, too, cherish a grievance. They give her a sound training only to see her desert the wards to do public health nursing, school nursing, industrial hygiene work, and the like. Some of the smaller hospitals especially are quite bitter about this exodus. One of the most frequent complaints has to do with educational requirements. These are declared to be uselessly high, too theoretical and professional and a chief cause of keeping numbers low and costs high. All the plaintiffs tend to picture the nurse as something of a profiteer who has lost the Florence Nightingale spirit of sacrifice and service.

"What has the defendant, the graduate registered nurse, to say about these indictments? Here are some of the things she believes ought to be considered. Her education has cost her time and some money—actually a substantial sum if what she might have been earning in other work is taken into account. After an elementary school course, and often one or more years of high school, she has spent three years in a hospital. She thinks that during her period of training the hospital had a good deal of work from her on fairly cheap terms. When she has finished her course she feels that she has the right to choose between continuing in hospital service and entering the fields of private nursing or salaried public health or institutional nursing.

"Fortunately, committees which include doctors, nurses, and lay people are beginning to study the problem with openmindedness and good will. They are making studies of the actual facts; they are considering the classification of nurses into three or even four kinds with appropriate training for each; they are discussing changes in the curriculum, better and more economical organization of nursing service both in the home and in the hospital, the more effective utilization of public health nurses, and means of making the nursing career more desirable. In all this the Rockefeller Foundation takes a deep interest, but it has no panacea to offer, no special program to impose."—Rockefeller Foundation.

THE DISCUSSION OF CERTAIN FEATURES OF ANGINA PECTORIS.*

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Angina pectoris is a condition in which pain is the outstanding feature. Even though it is associated with a variety of cardiac conditions, the pain, in the mildest to the most severe form, has certain fundamental characteristics. It is perhaps for this reason that the term "angina pectoris" has been retained.

The cause of angina pectoris has been extensively discussed and many hypotheses advanced. Aoritis, coronary artery disease and fatigue of the myocardium are the three most favored explanations. In the last mentioned theory, championed by the late Sir James Mackenzie,[1] it was assumed that an exhausted state of the myocardium was responsible on the basis that the syndrome may be produced by over-exertion in a young individual with a normal heart, as well as in an elderly one with a diseased myocardium. The increased incidence in the latter case was attributed to degenerative changes in the myocardium. It is evident, after careful analysis, that this conception does not differ essentially from the coronary hypothesis.

We are justified in assuming that angina pectoris is a manifestation of impaired function of either the heart or the aorta and that the pathological lesions in either of these structures, under certain circumstances, may be responsible for the distress. The fact that coronary occlusion produces pain typical of that of angina pectoris, except perhaps more severe, justifies the belief that an impaired blood supply to the myocardium is probably, in many instances, the cause of the syndrome. Under normal conditions the blood supply to the different sections of the myocardium is undoubtedly ample to meet the specific needs of the particular structures, even during periods of stress. If for any reason the blood supply to a certain area is reduced, the efficiency of this section is in consequence decreased. This section of the myocardium may be thus overtaxed by a load that is well within the functional capacity of the remaining cardiac musculature to carry. While it is well known that the occlusion of a coronary artery produces severe pain, it is conceivable that a much less extensive disturbance in the blood supply to a smaller section of the myocardium may, during periods of exertion, cause distress. The extent of the area with impaired circulation and the functional capacity of the remaining cardiac musculature would determine whether or not shortness of breath is experienced with the pain. It is a notable fact that the symptoms of angina pectoris frequently disappear with the onset of cardiac failure.[2] It is logical to assume, under these circumstances, that the functional capacity of all of the myocardium is reduced to a corresponding low level.

In a large percentage of the cases of angina pectoris that have come to necropsy, degenerative changes have been discovered in either the coronary arteries or the aorta and frequently in both. The coronary artery theory has been criticized because in a few instances there have been no demonstrable changes in these vessels.[3] The absence of gross changes in the coronary arteries, however, can not be regarded as a criterion of the efficiency of the coronary circulation. It is conceivable that there may be an impaired blood supply to a section of the heart without noticeable change in the gross appearance of the musculature. Furthermore very little is known in regard to the capillary bed of the heart. It is not impossible that a disturbance at this point in the coronary circulation may be a factor in the production of angina pectoris and cardiac failure. Mackenzie has pointed out that there may be a decrease in the number of the capillaries of the heart in later life, similar to that in the skin.[4] In the study of the capillaries of the heart of the cat, Wearn has shown that the number varies between 2,000 and 3,500 per square millimeter. Following the injection of histamine, however, the number is greatly increased, and in some instances was as high as 5,700 per square millimeter. Wearn concluded that these findings suggested a reserve supply of capillaries in the heart. It is not improbable that the number of reserve capillaries may be greatly decreased in diseased conditions of the myocardium.

The typical form of angina pectoris is sel-

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 17 to 19, 1926.

dom unrecognized. The clinical manifestations, however, are variable and the condition may be confused with other disorders, or even overlooked. In some there may be no more than a mild uneasiness or an indefinite sense of discomfort in the substernal region, a history of which is elicited only by carefully questioning the patient. While the pain is usually regarded as being substernal and felt near the level of the third rib, it may be at a higher or a lower level; under the xiphoid or referred entirely to the upper abdomen. In a typical case the pain is transmitted to the left shoulder and often down the arm on the ulnar side to the fingers. Occasionally the distress may be transmitted to the right shoulder. In some patients, however, the pain is first felt in the hands and arms and later, if the exciting factor continues, appears in the usual location in the chest. On the other hand, there are instances in which the distress is limited to one or both arms. In some patients the pain radiates to the neck and head and can be felt in the pharynx, the jaw, the mastoid region or the ear without appearing in the arm; or it may begin in the neck and head, and later reach the chest. The pain may not only be felt over the lower chest and upper abdomen, but in instances has been known to be referred to the testicles and also to radiate down the leg.

Even though the distress may vary in character and have a wide range of distribution, the type of pain, except perhaps for its degree of intensity and its extent of radiation during different attacks in an individual, is constant. Furthermore the attacks, in a majority of instances, are definitely related during the course of the disease, to factors which increase the work of the heart and aorta. The exciting factor may be the added effort of walking briskly, of climbing stairs, etc., or it may be the load imposed on the heart by increase of blood pressure accompanying excitement or, again, the interference with cardiac function due to distention of the stomach by a full meal and perhaps the associated accumulation of gas. In the instances in which the pain awakens the patient from sleep, some attacks, no doubt, are precipitated by an increase in blood pressure accompanying nightmare.[5] In doubtful cases, therefore, the influence of the various factors which may increase the work of the heart should be carefully considered. A few weeks ago a man past sixty years of age was seen, who complained of distress which was definitely localized in the epigastrium. This distress was a feeling of heaviness and appeared at a fairly regular interval, especially after the midday meal. He had been seen by a stomach specialist and his trouble diagnosed gastric ulcer. Upon questioning the patient, however, it was discovered that the discomfort was seldom experienced except after lunch. It was further found that the patient was in the habit of walking to his office about one hour after lunch and it was at this time that the distress was usually noticed. He had observed that the pain promptly subsided after reaching his office and that he might obtain relief by resting on the way. He would not admit that the pain was ever felt over the lower chest. The diagnosis of obscure forms of angina pectoris is therefore frequently dependent on a carefully detailed clinical history. The heart may be normal in size, the rhythm regular and the auscultatory findings negative and there may be no significant changes observed in the electrocardiogram.

Coronary occlusion is frequently mistaken for severe forms of angina pectoris. The character and distribution of the pain may be similar. In coronary occlusion, however, the pain is apt to be more severe, and instead of disappearing within a few minutes or a relatively short time at the outside, may continue for hours or days and even persist in minor form after repeated hypodermic administration of morphine.[6] Not infrequently the onset is accompanied by shortness of breath and cyanosis and be followed shortly by the appearance of other signs of cardiac failure. There is often noted, in addition, definite changes in the cardiac findings, such as increase in the area of cardiac dullness, irregular action of the heart, muffled cardiac tones, gallop rhythm and an apical murmur. Occasionally a pericardial friction rub may be heard on the following day. The temperature may be slightly elevated for a few days, and the number of leukocytes increased. Very often the blood pressure is reduced and the systolic pressure may be as low as 80 mm. Hg. If electrocardiograms are taken daily the curves will often show strik-

ing alteration in the ventricular complexus and frequently progressive changes in the T waves.[7]

A satisfactory treatment of angina pectoris is dependent upon a thorough knowledge of the physical condition, temperament and habits of the individual, and demands resourcefulness on the part of the physician. After the examination is completed, the patient usually will want to know the nature, and frequently the prognosis, of his condition. He may have surmised that he has angina pectoris and perhaps he may know something of its dangers. In every instance it is felt that the patient should be told the nature of the distress and a hint be given concerning the seriousness of the condition. This may be done in a way that will emphasize the necessity of following the advice concerning the treatment without unduly alarming the patient. Those patients who may know more of the significance of the pain, and perhaps be alarmed, should have the advantage of the hopes that come with the knowledge of the favorable features of the condition. In emphasizing this point, Dr. James B. Herrick[8] has recently pointed out that recovery has been seen, improvement is common and individuals have been known to live for twenty years. He, however, cautions against omitting reference to the serious nature of the illness and against minimizing the gravity too much, otherwise the patient is apt to soon disregard some of the suggestions concerning the treatment, which may cause unfortunate results, or he will soon lose confidence in his physician if he fails to relieve the distress. Each individual with angina pectoris presents a different problem and frequently the utmost tact within the bounds of truthfulness must be employed to insure satisfactory control.

Even though Dr. Herrick teaches that certain reservations are justifiable in discussing the condition with the patient, he insists that the family, or those nearest the patient, have a thorough understanding of the serious nature of angina pectoris. This will not only protect the physician against criticism in case of sudden death, but will promote coöperation of the patient through the influence of the relatives and friends.

Angina pectoris may be regarded as a manifestation of an impaired function of the heart or aorta which is fundamentally dependent on pathological changes in these structures. It is often precipitated by a disease state elsewhere in the body which has influenced the general health or by the hypersensitive nervous system of the professional or business man from high tension life or by the extra load imposed by numerous other excesses. It is the task of the physician to discover these various contributing factors and eliminate them, if possible. The treatment of a latent lues, the eradication of focal infection, the systemic management of a hypertension, chronic nephritis or gout may markedly benefit, or even eliminate, the angina pectoris.

In patients in whom there are extensive pathological changes in the heart and manifestations of cardiac failure, the attention necessarily should be directed toward restoring the function of the myocardium. It may be necessary to put the patient to bed, to promote sleep and administer digitalis. Very frequently rest of the nervous system will produce striking results in patients who have been working under excessively high nervous tension. This is obtained through recreation and sleep. It may not be possible for the patient to leave his business for a vacation. He can, however, by some means, lessen his responsibilities, and sleep should be obtained even by the use of a hypnotic.

Those patients who eat heavily and indiscriminately, and perhaps have hypertension and often excess weight, may profitably reduce the quantity of food taken, and limit their diets to the simple foods, with a small portion of meat once a day and sufficient vegetables and fruit to move the bowel regularly. This frequently results in a reduction in weight and blood pressure and enables the patient to accomplish much more in a physical way than he has in the past.

Disturbance in digestion, particularly relative to excessive formation of gas, oftentimes may seem to the patient to be the seat of the trouble. The taking of simple foods in small amounts more often, if necessary, and the correction of a constipation will eliminate the trouble. In a few instances the individual unconsciously swallows air and then expels it to get relief. This usually may be overcome by calling his attention to the habit.

The patient should be instructed to respect the pain and avoid it whenever possible. There is not only an element of danger in the pain, but frequent attacks probably render the nervous

system more sensitive and thus, after a time, make succeeding attacks more easily precipitated. The patient should, therefore, be cautioned against exercising beyond the point at which he first becomes aware of the distress. In order to accomplish this end, it may be necessary to tone down his entire plan of living. The patient should understand that work, in whatever form, within his functional capacity, promotes the general health, but when this limit is exceeded it becomes a source of danger.

In some instances the individual is awakened from sleep by the pain. Under these circumstances the distress is frequently precipitated by the increase in blood pressure accompanying a nightmare. The physician is justified in administering hypnotics for a time in the hope that this disturbing element may be eliminated.

The pain subsides usually within a few seconds after discontinuing the exercise or eliminating the other exciting factors. Many patients obtain prompt relief from an attack by the use of the nitrites in the form of the nitrite of amyl pearl, nitroglycerin (grs. 1/50 to 1/100) and spirits of glonoin (1 gtt). The pearl is crushed in the handkerchief and inhaled, and the latter two are placed under the tongue. Any of these preparations may be conveniently carried in the pocket and employed often, if necessary, without apparent harm. The most satisfactory results are obtained in patients with hypertension. The beneficial results are due to the lowering of the blood pressure, the dilatation of the coronary arteries and the stimulating action on the heart. The load of the heart is thus decreased and its functional capacity increased through the action of the drug on the coronary arteries and the cardiac musculature. In patients with low blood pressure there is often not only no relief from the pain, but the discomfort may be aggravated by the accelerated action of the heart and the flushing of the face produced by the nitrites. The heart is extremely sensitive to a decrease in the blood pressure beyond a certain point and the function may be seriously disturbed. This fact probably accounts for this ill response to the drug on the part of those with hypotension.

Some physicians advocate the use of those nitrites which produce a more prolonged effect on the blood pressure, as the sodium or potassium nitrite or the erythrol tetranitrate. In severe attacks where the pain is not relieved by nitroglycerine or other preparations that have a rapid action, morphine may be necessary and should be given hypodermically in doses of 1/4 gr.

Reference has already been made to the administration of digitalis and the employment of other measures in patients with extensive cardiac disease and evidence of myocardial failure. The long continued use of iodides, even in the non-syphilitic, particularly those with hypertension, has in some instances been beneficial. Iodides and mercury are the drugs of choice in those with syphilis. If arsphenamine is employed, it should be used with caution and only in small doses.

Favorable results have been reported following the use of the purine base derivatives as diuretin, theocin and more recently euphyllin.[10, 11] These drugs have a diuretic action and dilate the coronary arteries. Theocin, and particularly euphyllin, greatly increase the rate of coronary flow and have a favorable action on the heart. In certain instances either of the latter drugs no doubt improves the efficiency of the heart and relieves, or even entirely eliminates, the pain. Theocin is not tolerated well by the stomach. Euphyllin, however, may be given in doses of grs. 1½ after meals over a long period of time without disturbing the gastro-intestinal tract or kidneys.

Within recent years the resection of various portions of the sympathetic nerves has been recommended in the treatment of angina pectoris.[12] In some instances the pain has been eliminated by this procedure.[13, 14] It is, however, difficult at the present time to estimate the value of this method of treatment. The nature of the pain is not clearly understood and the influence of the section of the sympathetic on the heart is not known. In the tortoise, stimulation of the sympathetic nerves causes a constriction of the coronary arteries.[15] There is also suggestive evidence that these nerves supply, with constrictor fibers,[16] the coronary arteries of the mammal. The latter fact, however, has not been conclusively proven. If we are to regard the appearance of anginal pain as a warning signal, it is conceivable that the removal of this signal may eliminate a necessary protective measure. There are no doubt instances, however, in which the nervous system may be so sensitive that the indicator is very delicate. It would thus seem, under these circumstances, that the indicator may cease to serve, trustworthily,

its function and may justifiably be removed. If, in addition, section of the sympathetic improves the coronary circulation comparable to that in the leg following resection of sympathetic ganglia in Raynaud's disease, the operation would have an additional advantage.[17] Until, however, a more satisfactory physiological basis is established for the operation, great care should be exercised in selecting the patients. The operation, furthermore, should not be attempted by surgeons who are not thoroughly familiar with the anatomy of the sympathetic nerves, otherwise reports will be wholly untrustworthy.

More recently Swetlow and Schwartz[18] have reported the use of paravertebral injection with alcohol of the dorsal root ganglion and rami communicantes for the pain of angina pectoris. They employed this form of treatment in five patients and in each instance obtained satisfactory results. This procedure, because of its apparent simplicity, the unassociated dangers and promising results, seems to have many advantages over the resection of the sympathetic nerve and justifies further study.

REFERENCES

1. Mackenzie, James: Diseases of the heart, London, 1910.
2. Mackenzie, James: Principles of diagnosis and treatment in heart affections, London, 1917.
3. Vaquez, Henri, and Laidlow, G. F.: Diseases of the heart, Philadelphia, 1925.
4. Wearn, J. T.: Studies of the capillaries and thebesian vessels of human and cat hearts. Proc. Am. Soc. Clin. Investigation, May 4, 1925. Jour. Clin. Investigation, Aug., 1925.
5. Mac William, J. A.: Blood pressure in man under normal and pathological conditions. Physiol. Re views, 1925, 3, 303.
6. Herrick, J. B.: Clinical features of sudden obstruction of the coronary arteries. Jour. Am. Med. Assn. 1919, 59, 2015.
7. Smith, F. M.: Electrocardiographic changes following occlusion of left coronary artery. Arch. Int. Med. 1923, 32, 497.
8. Herrick, James B.: Billings-Forchheimer's therapeusis of internal diseases, George Blumer edition, New York, 1924.
9. Smith, F. M.: The action of nitrites on the coronary circulation. Arch. Int. Med., 1921, 28, 877.
10. Guggenheimer and Sassa: Klin. Wchnschr., 1923, 2, 1451.
11. Smith, F. M., Miller, G. H., and Graber, V. C.: The effect of caffein sodio-benzoate, theobromin sodio-salicylate, theophyllin and euphyllin on the coronary flow and cardiac action of the rabbit. Jour. Clin. Investigation, December, 1925.
12. Jonnesco, T.: Traitment chirurgical de l'angine de poitrine par les resection du sympathetique cervicothorocique. Bull. Acad. de Med., 1921, 86, 208.
13. Coffee and Brown: The surgical treatment of angina pectoris. Arch. Int. Med. 1923, 31, 200.
14. Levine, S. A., and Newton, F. C.: The selection of patients with angina pectoris for sympathectomy; with a report of additional cases. Am. Heart Jour., 1925, 1, No. 1, 41.
15. Drury, A. N., and Smith, F. M.: Observations relative to nerve supply of coronary artery of the tortoise. Heart, 1924, 11, 71.
16. Smith, F. M., Miller, G. H., and Graber, V. C.: Action of adrenalin and acetyl-cholin on the arteries of the rabbit. Am. Jour. Physiol. (in press).
17. Adson, A. W., and Brown, G. E.: Treatment of Reynaud's disease by lumbar ramisection and ganglionectomy and perivascular sympathetic neurectomy of common iliacs. Jour. Am. Med. Assn., 1925, 84, 1908.
18. Swetlow, G. I., and Schwartz, S. P.: The treatment of cardiac pain by paravertebral alcohol block. Jour. Am. Med. Assn., 1926, 86, 1679.

THE EFFECTS OF CARMINATIVE VOLATILE OILS

An investigation into the effects of the oils of peppermint, cinnamon, anise, caraway, wintergreen, fennel and orange indicates that the primary effect of these carminatives in concentration and doses comparable to those used clinically, is to relax the stomach and increase the tone and contraction of the small intestine and colon. Relief of discomfort by carminatives after a full meal can be understood easily in view of the relaxation produced by them; while in the intestine the effects of distension with gas or fluids would be relieved by increase in tone and contraction. (Jour. A. M. A., July 17, 1926, p. 176.)

RAY AND LIGHT THERAPY IN OTOLARYNGOLOGY

Violet ray and quartz light therapy have not been scientifically established as of great value for conditions of the nose and throat, as compared with the generally accepted medical treatment. With every new type of treatment, especially along the line of mechanical or physiotherapy, some investigators become overenthusiastic and report glowing results. As time elapses, it is found that most of these measures give some relief to a small percentage of patients but fail entirely in many others. (Jour. A. M. A., Aug. 21, 1926, p. 607.)

TRICHINOSIS*

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The opinion of most authors is that the treatment of trichinosis is still unsatisfactory. Here and there single cases have been reported or a group of a few cases in which some particular form of treatment has been said to be efficacious. While it has been definitely recognized that the administration of anthelmintics, in particular thymol, and severe purging, removes a great number of worms in the early stage of the disease, the fact that so many drugs have been used in the treatment of trichinosis after the larvae have invaded the muscles, indicates that there is no agreed method of treatment in this stage. While a host of drugs and various forms of treatment have been advocated, I wish simply to call attention to a few specific drugs.

Van Cott and Lintz (1914) treated two cases with salvarsan, one during the fifth week and the other during the fourth week. In the latter, eleven days later, neosalvarsan was administered; this patient died, the other recovered. McNerthy and McNerthy (1916) treated a very ill patient suffering from trichinosis with 0.06 gm. of neosalvarsan and, because this patient recovered, they concluded that neosalvarsan was the proper treatment in this disease.

Salzer (1916) in a paper published without protocols, and containing certain dogmatic conclusions, ascribes to serum obtained from patients who had recovered from trichinosis, not only a prophylactic but a curative property. He reported that this serum decreased the eosinophilia within a few hours, while normal serum had no such effect. He also obtained curative effects with this serum in experimental rabbits within twenty-four hours; he was further able to protect animals with this serum against infestation after trichinous meat had been fed.

Schwartz (1917) reviewed this paper and repeated the experiments in so far as he was able from the meager data presented. He came to the conclusion that (1) serum from convalescent animals did not produce immunity when injected into other animals; (2) the serum from convalescent animals when mixed with trichinous meat did not prevent this meat from being infective; (3)animals once infected could be reinfected; and (4) serum from convalescents had no ostensible ill effect on larvae freed from their cysts.

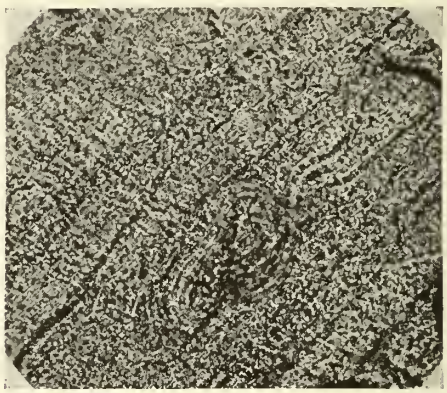


Fig. 1. Larva of trichina in the stage of active migration in the muscle tissue.

None of the results of experiments appeared to be in harmony with Salzer's conclusions concerning the prophylactic or curative valve of serum from convalescent animals.

Hall and Wigdor (1918) repeated the work of Schwartz and reviewed Salzer's claims. They did not agree with Schwartz in his rather wholesale rejection of Salzer's conclusions but agreed with him as far as his experiments went. They state: "Salzer may be right in part of his assertions and the treatment that he suggests worthy of more approval than Schwartz is inclined to accord to it." They felt that, while there is no theoretical reason to believe that the administration of serum from convalescents could affect the mechanical effect of the migration of larvae, there is reason to believe that a toxic product was developed by the growth of these larvae which the serum of convalescents might neutralize.

Alexander (1923), after reviewing the literature, came to the conclusion that there is no satisfactory treatment for trichinosis and that all one can do at the present time is to treat the disease symptomatically.

M. Algora Y. Nieto (1924) reports prompt recovery in seven cases in which 0.45 gm. of neoarsphenamin was injected two or three times.

Grove (1925) reported the treatment of a patient with antimony potassium tartrate. He administered 1 c.c. of a freshly prepared 2 per cent

*From the Section on Clinical Pathology, Mayo Clinic, Rochester, Minnesota.

Read before the American Society of Parasitologists, Kansas City, Missouri, December 29-31, 1925.

solution intravenously for the first dose, the next day 2 c.c., the next day 3 c.c., and two days later 4 c.c. The patient recovered.

It is difficult to evaluate the effect of treatment in the cases of trichinosis reported in the literature because critical data are not available; most authors report their results in single or a very few cases, and little consideration is taken of the fact that the mortality in trichinosis varies with many factors is particularly with the number of larval trichinae that migrate into the muscles. I am unable to find that counts of larvae have been made in muscles before and after treatment. In most cases the diagnosis has been established by making sections taken from various muscles in the body; in some it was established by the finding of particular types of muscle infiltration, the larvae not being seen.

The mortality reported in epidemics of trichinosis varies so much that it is very hazardous to attribute cure in a given case to any certain form of treatment. If the larvae in the muscles cannot be reduced in number and if they go through their normal life-cycle, it is hard to see how one can credit some specific treatment with the cure, especially when it is known that in more than half of the cases of trichinosis recovery is independent of any form of specific therapy. The nature of the toxin is not known and the demonstration of an antitoxin seems as yet not realized.

Attention should be called to the fact that Hall and Wigdor's series of animals was small, that the conditions of the different sets of experiments varied considerably, that the number of larvae for each unit volume of muscle was not recorded and that some of the treated animals died before

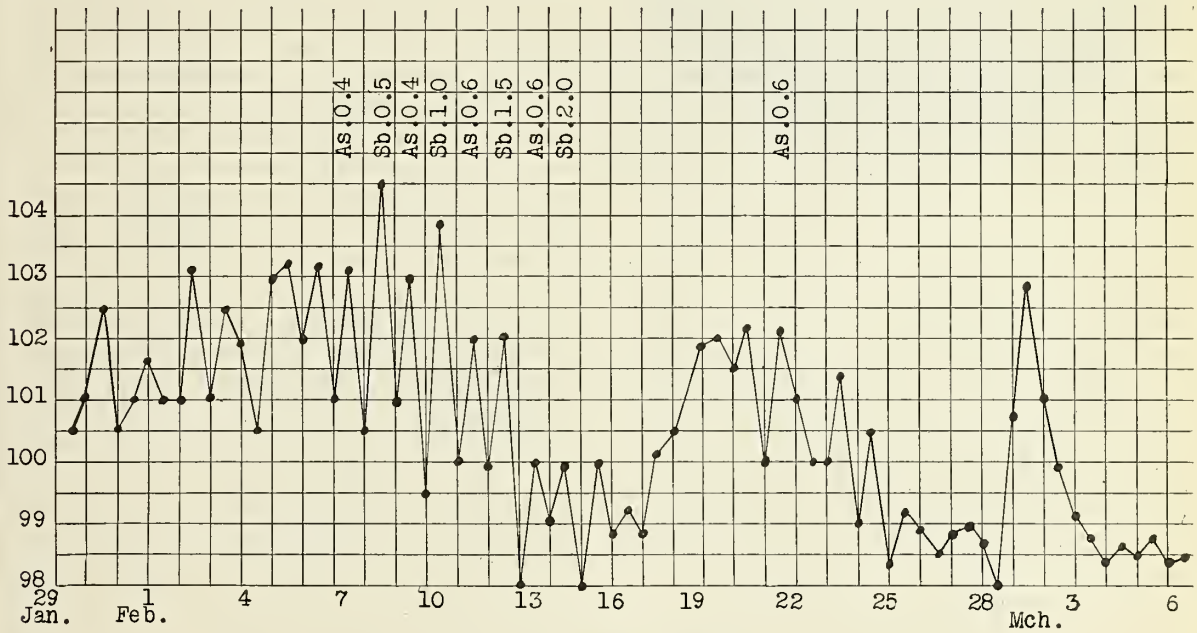


Fig. 2. Temperature chart.

This method is usually employed because the tissue pathologist who makes the diagnosis is more familiar with the method of sectioning tissues than the crushing method commonly employed in the diagnosis of trichinosis in hog-meat. This crushing method, which is far superior to that of tissue sections, consists of taking a piece of muscle and pressing it out between two glass slides until it can be examined under the 16 mm. objective; by this method larvae are readily seen and quickly counted. It is also possible to make satisfactory counts of the number in a unit field.

some of the control animals. In addition to that, the rats that were used in the experiment were evidently not standardized animals and the cause of death was not clear in some cases. At best there are very few instances in which the rats to which serum had been administered, outlived appreciably those untreated. For this reason I do not feel they are justified in the conclusion that "the longevity data from our experiments lead us to the conclusion that such a serum may be of decided value in combating the toxic features of trichinosis." In fairness to these authors, it

should be stated that this conclusion was based on theoretic considerations and the clinical observations of Salzer which apparently have not been repeated.

As an example of how one may be misled in drawing conclusions in the value of specific forms



Fig. 3. Larva of trichina in the early encysted stage.

of treatment in trichinosis, I wish to call attention to the following case:

A farmer's daughter, aged seventeen, a resident of South Dakota, arrived at the clinic January 29, 1923, complaining of swollen eyes and headache of four days' duration. The day previous she had chills and fever beginning in the morning and had vomited once that evening. She had had previous trouble with her eyes which was relieved by glasses; and, while she was now dizzy and suffering from diplopia, this condition had been present for some time and she did not ascribe it to her present illness.

She was a well nourished girl, and weighed 70 kg. Both the upper and lower eyelids were swollen to some extent, the conjunctiva being hyperemic. There were hemorrhagic areas in the subconjunctiva on the temporal side of the right globe. The veins in the retina were full and dark but there was no edema, and no hemorrhagic areas on the right side although there were small hemorrhagic patches on the left. The thyroid was enlarged and soft, the heart rapid, the pulse 96, the temperature 101.2°, the systolic blood pressure 104, and the diastolic 82. Slight dulness and moist râles were found over the bases of both lungs. The abdominal muscles were tender; there was no rash. The urine showed no abnormal findings. The blood count made January 31 was normal. A differential blood count was made on February 6; at that time there were 15,400 leukocytes, 10 per cent small lymphocytes, 60.5 per cent neutrophils, 23.5 per cent eosinophils and 0.5 per cent basophils. The Wassermann test was negative and the blood culture negative, but in the blood were found a few larvae of *Trichinella spiralis*. It was then learned that two weeks previous, she had eaten raw pork for the first time in her life but that at no time had she had diarrhea.

February 7 a spinal puncture revealed the pressence of larvae of trichina and a cell count of 2 small lymphocytes. A specimen removed from the right pectoral muscle on the same day contained 15 larvae for each cubic millimeter of muscle tissue. There were no signs of encysting and all were still actively wandering in the muscle tissue (Fig. 1). Intensive treatment was begun with neo-arsphenamin and antimony potassium tartrate:

February 7, Neo-arsphenamin 0.4 gr. intravenously
February 8, Antimony potassium tartrate 0.5 gr. intravenously
February 9, Neo-arsphenamin 0.4 gr. intravenously
February 10, Antimony potassium tartrate 1.0 gr. intravenously
February 11, Neo-arsphenamin 0.6 gr. intravenously
February 12, Antimony potassium tartrate 1.5 gr. intravenously
February 13, Neo-arsphenamin 0.6 gr. intravenously
February 14, Antimony Potassium tartrate 2.0 gr. intravenously
February 21, Neo-arsphenamin 0.6 gr. intravenously

During this treatment there was no immediate change in the course of the disease; the course was exactly what would be expected of such a case of trichinosis without treatment. The pains and edema became more marked, and the fever continued to run from 101° to 104° with only occasional reversions to normal (Fig. 2). It can be noted on the temperature chart that while at times, for instance February 14, 15, 16 and 17, the temperature was not so high, thereafter it rose to the neighborhood of 103°. There were several sudden rises, and a normal temperature was not reached until March 3. Several times during her stay in the hospital such alarming symptoms of dyspnea were manifested that death seemed imminent. It was not until March 10 that the patient felt well enough to sit up. Thereafter she recovered rapidly. March 13 another specimen of muscle removed from the right pectoral muscle revealed the presence of sixteen larvae of trichina for each cubic millimeter. They were all encysted (Fig. 3). The patient was discharged March 29, apparently well.

It seems to me that one cannot dodge the conclusion that this patient recovered regardless of the treatment rather than because of it. It is certain that we did not affect the number of larvae in the body by this treatment, and to consider neutralizing larval toxin with arsenic and

antimony is certainly so theoretical as to be unjustifiable at this stage of our knowledge. Since we know other patients with trichinosis who were equally ill recover without the use of any drug, it is certainly not fair to attribute recovery in this case to the use of these drugs.

I wish to make a plea for more careful evaluation of the effect of specific drugs used in the treatment of parasitic diseases, with a view to removing from our materia medica a long list of obviously ineffective anthelmintics.

BIBLIOGRAPHY

1. Alexander, M. E.: Trichiniasis, endemic and sporadic, with a review of the present status of the treatment of the disease. Am. Jour. Med. Sc., 1923, clxv, 567-577.
2. Algora Y. Nieto, M.: (Neo-arsphenamin in treatment of trichinosis.) Siglo méd., 1924, lxxiii, 160; abst. Jour. Am. Med. Assn., 1924, lxxxii, 1232.
3. Grove, J. S.: The use of antimony and potassium tartrate in trichinosis. Jour. Am. Med. Assn., 1925, lxxxv, 349-350.
4. Hall, M. D., and Wigdor, Meyer: An experimental study of serum therapy in trichinosis. Arch. Int. Med., 1918, xxii, 601-609.
5. McNerthney, J. B., and McNerthney, W. B.; Trichinosis, immediate results following intravenous injection of neosalvarsan. Jour. Am. Med. Assn., 1916, lxvii, 1086.
6. Salzer, B. F.: A study of an epidemic of fourteen cases of trichinosis with cures by serum therapy. Jour. Am. Med Assn., 1916, lxvii, 579-580.
7. Schwartz, Benjamin: Serum therapy for trichinosis. Jour. Am. Med. Assn., 1917, lxix, 884-886.
8. Van Cott, J. M., and Lintz, William: Trichinosis. Jour. Am. Med. Assn., 1914, lxii, 680-684.

SPAHLINGER TREATMENT FOR TUBERCULOSIS

From time to time M. Spahlinger has given out enthusiastic reports from his Geneva Hospital. Because of the favorable newspaper comment, more particularly in England, concerning this product a report was made on it by the Science Committee of the British Medical Association. In the statement of this committee, published last spring, the history of the preparation was summarized and the committee strongly emphasized that it cannot endorse "this or any new method until after a full and independent test." The committee concluded that the remedy is secret and that the exact methods of preparation have never been fully published; and, further, that no investigation carried out under strict experimental conditions which afford direct and convincing evidence of curative action has been published. (Jour. A. M. A., Aug. 28, 1926, p. 693.)

AMBLYOPIA CAUSED BY INHALATION OF CARBON MONOXID GAS*

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Minneapolis

Comparatively few cases of serious visual defects, temporary or permanent, due to inhalation of carbon monoxid have been reported in medical literature. Doubtless many of the cases of fatal acute carbon monoxid poisoning would have shown serious intraocular lesions, had the victims survived, but the reported cases of serious and permanent ocular lesions caused by chronic carbon monoxid poisoning are comparatively few.

It is evident, from the almost daily reports of fatal cases of gas poisoning, that carbon monoxid gas has become an extremely important health hazard, and is responsible for an alarmingly increasing number of accidental deaths.

Carbon monoxid is the principal product of incomplete combustion of carbonaceous matter and is the cause of more deaths than all other gases combined. It is odorless and non-irritating and its avidity for hemoglobin is 250 to 300 times greater than is that of oxygen, thus reducing the oxygen carrying power of the blood, and acting as a poison by preventing the normal supply of oxygen from reaching the body tissues.

Chronic carbon monoxid intoxication has not received the attention that it deserves and doubtless many cases are unrecognized. Very little attention has been given to the importance of carbon monoxid as a cause of such common ailments as headache, dizziness, gastric and psychic disturbances. That such complaints may be frequently due to the repeated inhalation of minute quantities of gas is not surprising when we are reminded of the almost universal use of gas for heating, cooking, and illuminating purposes, the general use of coal stoves and furnaces, and the constant presence of carbon monoxid in the exhaust gases of 20,000,000 automobiles in this country.

Employees in automobile garages and repair shops are constantly subjected to the dangers of carbon monoxid poisoning, unless protected by adequate ventilating systems, and the repeated inhalations of very minute quantities of carbon

*Read before the annual meeting of the Minnesota State Medical Association, Saint Paul, May 17 to 19, 1926.

monoxid over a long period of time may be more dangerous to the individual than a single exposure to the gas in much greater concentration.

In 1923, the Division of Industrial Hygiene[1] made a study of the health hazard to garage workers from carbon monoxid. One hundred and fifty-seven garages, service stations, and repair shops were inspected to determine the amount of carbon monoxid present in the atmosphere and its effect upon the health of the workmen. Tests were made for the quantitative determination of carbon monoxid in the blood and the percentage of hemoglobin was determined. In 69.5 per cent of the workers examined, the test for carbon monoxid was positive, while in all cases, with one exception, the hemoglobin was normal or nearly normal. It was found that in some garages, where carbon monoxid concentration in the air was demonstrable, the men examined did not show a corresponding percentage of carboxyhemoglobin, and some did not give a positive test at all; conversely, in some garages, where it was not possible to demonstrate any carbon monoxid in the air, some of the workmen gave a positive test for carboxyhemoglobin. These discrepancies were due to the rapid elimination of carbon monoxid, the rate of elimination being from 30 to 50 per cent per hour, depending upon the amount of fresh air inhaled. It was also found that it is possible for a workman testing and adjusting a car for one hour to absorb enough carbon monoxid to show a carboxyhemoglobin saturation of 22 per cent, when the concentration of carbon monoxid in the air of the garage does not exceed 4 parts in 10,000. A test in a large garage of the air surrounding a car, with the engine running, taken 10 feet from the exhaust and at a height of 4 feet from the floor, showed 10 parts of carbon monoxid in 10,000, while 30 feet from the car, it was not possible to obtain a positive test. In 77.5 per cent of the garages inspected, carbon monoxid was present in the air in different concentrations. The workmen gave a history of headaches in almost all cases, and gastric symptoms were common.

In cases of chronic carbon monoxid intoxication the more common symptoms are headache, dizziness, gastro-intestinal disorders, languor, palpitation, muscular weakness, and mental disturbances. The central nervous system is the first to be affected in carbon monoxid toxemia and the characteristic headache is one of the earliest symptoms. Forbes, Cobb and Fremont-Smith[2] demonstrated that carbon monoxid causes a marked rise in cerebrospinal fluid pressure and concluded that the carbon monoxid headache is closely assiciated with, if not directly caused by, an increased intracranial pressure due to congestion and possibly also to edema.

The fibers of the optic nerve apparently are not especially susceptible to the action of carbon monoxid, nor are the delicate papillomacular fibers which are so susceptible to the action of such toxic agents as tobacco and alcohol. Ocular nerve lesions, however, are frequently present in carbon monoxid poisoning and are due to involvement of the nuclei of origin of these nerves, and we find such ocular lesions as paralysis of the external and internal ocular muscles, disturbances of the pupillary reactions, homonymous hemianopsias, diplopia, visual field changes, color blindness, optic neuritis, subconjunctival and retinal hemorrhages. The earliest and most constant ocular sign of carbon monoxid intoxication is congestion of the retinal veins and hyperemia of the optic disk. While these commoner eye lesions usually disappear, a review of the literature shows a number of reported cases of serious and permanent visual defects due to inhalation of carbon monoxid gas.

Wilmer[3] reports two cases of permanent visual defects. The first case, a boy eight years of age, had a chronic carbon monoxid poisoning caused by inhalation of coal gas from a defective furnace. Four years later examination of the eyes showed pupil reactions normal, motility of the eyeballs and muscle balance normal, central visual acuity good, visual fields much contracted, paracentral scotoma, and enlargement of the blind spots. The second case, a workman thirty-five years of age, had used a gasoline torch in a closed room. For about two hours afterwards he had felt faint, dizzy, nauseated, and had a headache. These symptoms disappeared in a short time. Two days later vision became blurred and remained so for two days. Two months later he again used the gasoline torch in a closed room and two days later vision was impaired and became progressively worse. Two months later his vision was 13/200 in the right eye, 20/200 in the left eye. Pupils were unequal

and reaction to light was sluggish; color sense was defective; visual fields were contracted; and there was optic nerve atrophy present.

Shumway,[4] in a discussion of Wilmer's cases, mentions a case of blindness occurring in a child six months of age and caused by inhalation of coal gas from a defective heater. Pupillary light reflex was absent; the optic disks presented a slight pallor, but no optic atrophy followed. Permanent blindness, as well as permanent deafness, resulted.

A case of blindness following carbon monoxid poisoning is reported by Abt and Witt.[5] A boy, five years of age, was unconscious for one and one-half hours from acute poisoning by illuminating gas. There was nausea and vomiting for several days and there were several generalized convulsive seizures. Several days later, there was external lagophthalmos, slight reaction of pupils to light, dilatation of retinal veins, and a retinal cyanosis present. One week later ophthalmoscopic examination showed optic neuritis. Fourteen days after the accident there was secondary optic nerve atrophy and total loss of vision.

Sibelius[6] reported a case of total blindness following carbon monoxid poisoning, and Purtscher[7] has reported a case of blindness in a man sixty years of age. No lesions were present in the fundus of the eyes and blindness was assumed to be due to hemorrhage or areas of softening in the visual centers.

A case of industrial blindness is reported by Thompson.[8] His patient, thirty years of age, had been employed in a large automobile garage and complained of failing vision. With the right eye he was able to count fingers at two feet. Vision in the left eye was 20/40. Visual field in the left eye was completely obliterated on the temporal side, and reduced for form and colors on the nasal side. Pupillary reaction was normal and there was no fundus pathology. Eight months later, vision in the right eye equalled counting of fingers at four feet. Vision in left eye equalled 20/30.

The National Industrial Conference Board[9] records a case of blindness in one eye and defective vision in the opposite eye, occurring in an automobile mechanic. According to medical testimony, the defective vision was due to exposure to gases created by the exhaust from automobile engines. In this case the Colorado Industrial Commission held that the employee's condition was due to repeated exposures to carbon monoxid gas, and was the result of "occupational disease," which is not covered by the compensation law. Claim for compensation was denied.

Fejer[10] reports a case of temporary blindness in a man sixty-two years of age, who fell into a tank containing coal gas. He was unconscious for several minutes and on regaining consciousness complained of disturbed vision. He could see to walk for about two days, and on the third day his sight disappeared. There was no paralysis of the external ocular muscles, pupils were equal and there were no fundus changes to be seen. Vision gradually improved and in three weeks his vision was normal in each eye, and visual fields showing but slight contraction.

A case of blindness due to illuminating gas is reported by Horvath.[11] The visual acuity improved to 5/50 in two months. The author assumes that the amaurosis was due to a hemorrhage or other encephalic lesion in the visual center.

Levy-Valensi, Claud and Rochard[12] report a case of amaurosis caused by a single exposure to carbon monoxid gas. The patient was in a coma for four or five days and on regaining consciousness there was a marked visual defect present. On examination of the eyes one year after the accident, there was slight dilatation of the pupils with retention of light reflexes, incomplete bilateral optic atrophy of the post-neuritic type, and remains of small juxtapapillary hemorrhages. Vision was about 1/50 in each eye.

The following case came under my observation at the University Hospital and is reported on account of the very unusual character of the ocular lesions and on account of the very unfortunate outcome.

Patient, male, aged 24, farmer, was entered at the University Hospital February 10, 1925, on account of impaired vision in the right and left eyes of two weeks' duration. On the day previous to the onset of blurred vision, he was exposed to the exhaust gas of a gasoline motor for two hours while working in his garage, and gave a history of similar exposures on several previous occasions. The onset of the blurred vision in the right eye was accompanied by the appearance of a yellow spot, which later changed to a darker blurred area in the field of vision. Two days after the appearance of the yellow spot in

the right eye, the left eye became similarly affected, a yellow spot appearing, which likewise became darker. In both eyes the blurred area appeared to have a revolving yellow halo around the periphery. He had diplopia at times, some nausea and vomiting, and headache.

On the day preceding his admittance to the University Hospital, he was registered at the out-patient department, where he was seen by Dr. McKinley and by Dr. Goss. Examination of the eyes at that time showed slight tenderness of the eyeballs on palpation, normal tension, injection of the bulbar conjunctivæ, inequality of the pupils, reaction to light and convergence clear, intraocular media clear, blurred disk margins, slightly contracted retinal arteries, and relatively engorged veins. Visual fields showed contraction, with sector defects, for red and blue; no scotoma was present and no enlargement of the blind spot. He was unable at this examination, or at subsequent ones, to distinguish green color. Vision in right eye was 20/200; left eye 10/200.

On admittance to the hospital a general physical examination showed lungs, heart, kidneys and abdomen negative; neurological examination was also negative. Blood analysis: urea nitrogen 12.13; creatinin 1.80; sugar .099; hemoglobin 97; red blood cells 4,700,000; white blood cells 8,200; polymorphonuclears 60 per cent; lymphocytes 36 per cent; large mononuclears 2 per cent; transitionals 2 per cent. Blood Wassermann was negative. Spinal fluid: clear with normal pressure; cell count 214, Nonne plus, Noguchi plus, Wassermann negative. Carbon monoxid hemoglobin with NaOH test, was positive. Two days later spectroscopic test for carbon monoxid hemoglobin was negative and NaOH test for carbon monoxid hemoglobin was also negative.

Ocular examination: Bulbar and palpebral conjunctivæ mildly injected; external ocular muscles normal; no ptosis and no nystagmus. Pupils were irregular; right pupil larger than left with sluggish reaction to light. Intraocular media clear. There was bilateral papilledema, contraction of the retinal arteries, and dilated veins. The retinæ presented a diffuse, grey-white opacity which extended uniformly throughout the fundus and was but slightly elevated; there was a retinal edema present. Vision was failing rapidly and he was able to distinguish moving objects but was unable to recognize individuals. When he left the hospital one week later, his vision was reduced to the perception of hand movements before right and left eyes. A few weeks after the patient left the University Hospital, he was examined by Dr. F. E. Burch, who found retinal edema and large massive vitreous exudates present. Vision at that time was perception of light. May 15, 1926, fifteen months after the onset of the eye involvement, this patient was re-examined by Dr. Burch and also by the writer. Ophthalmoscopic examination showed extensive chorioretinal lesions, without pigment, scattered throughout the fundus, and opacities in the vitreous. Vision in the right eye equalled 10/200, left eye equalled 2/200.

BIBLIOGRAPHY

1. Jour. Industrial Hygiene, July, 1924, 6, 102-109.
2. Forbes, Cobb, Fremont-Smith: Arch. Neurol. and Psychiat., 1924, 11, 264-281.
3. Wilmer, W. H.: Am. Jour. Ophth., 1921, 4, 73.
4. Shumway, E. A.: Am. Jour. Ophth., 1921, 4, 133.
5. Abt, J. A., and Witt, D. B.: Med. Clin. of No. Am., 1922, 5, 1645.
6. Sibelius: Quoted by Abt and Witt.
7. Purtscher: Quoted by Abt and Witt.
8. Thompson, H. M.: Colorado Med., 1922, 19, 145.
9. The National Industrial Conference Board: 1923, 7, 3.
10. Fejer, G.: Am. Jour. Ophth., 1924, 7, 522.
11. Horvath, B.: Zeit. f. Augenh., 1924, 52, 110.
12. Levy-Valensi, Claude and Rochard: Bull. et mem. Soc. Méd. d hôp. de Paris, 1924, 48, 349-351.

TUBERCULOSIS IN CATTLE DECREASING

According to an item in the July number of the *American Journal of Public Health*, the United States Bureau of Animal Industry has reported that tuberculosis in cattle seems to be on the decline. A survey completed on May 1, 1926, gives a reduction in the prevalence of the disease from 4 per cent in 1922 to 2.8 per cent in 1926.

CRYSTALLINE TUBERCULIN

The isolation of a crystalline protein with tuberculin activity has been reported. The crystallized product elicits the characteristic skin reaction in tuberculous subjects. Chemically, it is shown that wherever the activity is lost, following enzyme treatment, there occurs also a corresponding reduction in whole protein, with an increase in proteose and residual nitrogen. (Jour. A. M. A., Aug. 7, 1926, p. 417.)

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EDITORIAL

The Practitioner and the Ophthalmoscope

The importance of the ophthalmoscopic examination in the practice of internal medicine has been repeatedly urged upon the profession by writers of text-books. Osler in the nineties said that it was remarkable in how many cases of interstitial nephritis the condition was diagnosed first by the ophthalmic surgeon. Christian and O'Hare say that the eyegrounds give so much information in the nephritic vascular diabetic and the brain-tumor patient, that the house officer and physician should use the ophthalmoscope with the same regularity as the stethoscope and they consider this easier to use intelligently than the latter. They devote four pages of Oxford Medicine to the consideration of eye changes in nephritis.

Fisher states that the acquirement of the necessary practical and theoretical knowledge is easy and within the reach of all, but finds that scarcely 2 per cent of the practitioners taking post-graduate courses from him know how to use the ophthalmoscope.

If the first statement is true, the second is not creditable to the profession.

On the other hand Houghton, who is in constant contact with ophthalmologists, takes issue with similar opinions. After getting answers to certain questions put to nine ophthalmologists, of various affiliations, "without assigning any reason for the inquiry," he concludes:

1. That to make a proper examination of the eyegrounds a mydriatic is necessary—as necessary as the removal of clothing for the use of the stethoscope. (Permission to use a mydriatic as a routine measure is certainly not easily obtainable outside of the larger clinics or the office of the specialist.)

2. That prolonged study, of some months, under competent instruction, at an institution dealing with a variety of patients in quantity, is necessary for the recognition of the more obvious and later forms of arterial degeneration in the retina. If followed by some years of regular and constant practice, the internist may come to recognize some of the earlier changes in the finer arteries of the fundus.

3. That the changes found are often of doubtful diagnostic significance.

Houghton feels that—apart from objections of an economic nature—the time spent in acquiring proficiency in ophthalmoscopy might be better spent in making oneself master of more useful knowledge.

Those of us who have striven—without notable success—to use the ophthalmoscope efficiently in the diagnosis of internal disease may, it would seem, console ourselves with the reflexion that most of the grapes are sour anyway.

H. B. A.

Physicians and the Press

Among the papers appearing in this issue of the journal is one dealing with the relations between members of the medical profession and the press by Herbert R. Galt, managing editor of the St. Paul Pioneer Press and Dispatch. Mr. Galt is perhaps peculiarly qualified to discuss this subject from both the standpoint of the press and the medical profession. Being a newspaper editor certainly qualifies him in discussing the viewpoint of the press and the difficulties encountered in presenting medical news to the public. Since his father was a surgeon in the

United States navy and later chief surgeon on the Confederate cruiser, Alabama, he undoubtedly absorbed, unconsciously perhaps, some of the medical viewpoint in his early youth.

Mr. Galt points out the great news value of medical progress. Certain it is that the public is much more interested in medical subjects than ever before. The observing physician, however, has seen so often the premature publication not only in the newspapers but even in medical journals of supposedly important discoveries only to see the perfected advances fail to stand the test of time that he depreciates early publicity of this sort. The premature publicity given to new drugs in recent years by such institutions as Johns Hopkins is most regrettable.

The control of the new product, insulin, on the other hand is a shining example of the proper method of bringing out a new product.

Advertising is contrary to the accepted ethics of all professions, the medical profession included. We all recognize the fact that most newspaper publicity, unless distinctly derogatory, is in reality a form of advertisement. It is no wonder then that the conscientious physician, desirous of playing the game according to the rules, should shy when approached by the newspaper reporter.

In the comparatively rare instances when the press wants authentic opinions on some medical subject there should be and is no ground for criticism when representative members of the profession give out the desired information. Witness the recent misunderstanding apparently due to incomplete newspaper reports of Valentino's fatal illness wherein our Dr. Charles H. Mayo took up the gauntlet flung down by Dr. Marco Porzio of Rome, in defence of American surgery.

The recent advocacy of the Detroit cancer-cure nostrum of Dr. William F. Koch of Detroit by a member of the profession is, however, a good example of the danger of unregulated medical publicity. Each community has its publicty hounds whose opinions seem to be more in demand by the press rather than the profession.

In response to the increased interest in medical subjects on the part of the public there has been a noticeable and proper change in the attitude of the profession. The appointment of publicity committees by county and state societies is probably the most satisfactory means of handling the situation.

OBITUARY

Dr. Ernest A. French

Dr. Ernest A. French of Plainview, Minnesota, died at the age of 48 years, Tuesday, August 17, 1926, at Rawlins, Wyoming.

Ernest A. French was born March 13, 1878, on a farm in Highland township, Minnesota, the son of Mr. and Mrs. Jacob M. French. He obtained his early education there and was graduated from the Medical School of the University of Minnesota in 1903.

He had practised at Plainview for twenty years, but had disposed of his practice and started west, on account of symptoms arising from arteriosclerosis and hypertension.

He was taken sick with an attack of appendicitis at Rawlins, Wyoming, while en route to Portland, Oregon. He was taken to the Military Hospital, where a ruptured appendix was found, and he died August 17, 1926.

Dr. French was a member of the Wabasha County and Minnesota State Medical Associations at the time of his death.

Dr. French is survived by his wife, two sons, Rockwell and Donald, a brother, Alden M., of Portland, Oregon, and two sisters, Fannie G., of Detroit Lakes, Minnesota, and Mrs. D. A. Robbins of Minneapolis.

The following resolution of condolence was passed by the Wabasha County Medical Society, of which he was a member for many years.

Having learned with deep regret of the death of one of our members, Dr. E. A. French, who died while en route from Plainview to Portland, Oregon, we, the members of the Wabasha County Medical Society, through the undersigned committee appointed by the president, take this means of expressing our condolences and sense of loss.

Doctor French during his residence at Plainview was an active and efficient member of the society—ever a conscientious practitioner devoted to his art. He was highly esteemed by his confreres, and we of the society mourn his loss, and sympathize with the family in their bereavement.

It is ordered that a copy of this resolution be sent to the bereaved widow; and that this action and resolution be spread upon the minutes of the society.

(Signed)

Dr. W. J. Cochrane,
Dr. E. H. Bayley,
Dr. W. F. Wilson,
Committee.
Dr. J. S. Collins,
President, Wabasha County Medical Society.

Dr. Milo E. Bushey

Dr. Milo E. Bushey, pioneer physician of Arlington, Minnesota, died at the age of 71 years, Saturday, August 28, 1926, at his home.

Dr. Bushey came to Minnesota from Ohio shortly after finishing his medical course at the St. Louis Medical College 43 years ago and helped found the town of Arlington. He started his practice as a physician

among pioneers in the sparsely settled territory, and became known as "the doctor who never fails to come," after he had repeatedly been prompt in his calls on his patients, in spite of howling snowstorms and long trips by horse and buggy through the wilderness.

The pioneer physician, at different times, served several terms as mayor of Arlington and president of the school board, and had been a leader in all community enterprises. He was a member of his county, state and national medical associations at the time of his death.

Dr. Bushey is survived by his wife, a daughter, Marie, both of Arlington, and a son, Richard Bushey of Howard Lake, Minnesota.

Dr. Edwin J. Lewis

Dr. E. J. Lewis, aged 78, father of Dr. C. B. Lewis of St. Cloud, and of Sinclair Lewis, world famous novelist, died at midnight, August 29, 1926, at his home at Sauk Centre. Although he had been in failing health for some time, the end came unexpectedly.

Edwin J. Lewis was born in New Haven, Connecticut, where he lived until he was about seven years of age, when the family removed to Harrisburg, Pa. He often told of how, as a boy of nine years, he heard the distant thunder of guns of the decisive battle of Gettysburg, which was fought only eighteen miles from Harrisburg. Confederate scouts frequently rode into Harrisburg during the progress of the battle until they were driven off by the union cavalry.

When he was 14 years old, the family removed to Elysian, a small town near Mankato, Minnesota, and there as a young man, prcvious to entering Rush Medical school, he taught in the country school.

Dr. Lewis was one of the oldest physicians in Stearns county. In him were all the graces, the geniality and kindness of the "country doctor." He was graduated from Rush Medical College in 1877 and settled in Ironton, Wisconsin, where he practiced his profession for six years. In 1883 he moved to Sauk Centre, where he practiced his profession almost up to the time of his death. In his long residence at Sauk Centre he became widely known and proved himself a typical and able family physician. He was a member of the Stearns-Benton Medical Society and of the state and national associations.

Dr. Lewis is survived by his three sons, Dr. C. B. Lewis of St. Cloud, Minn., Fred Lewis of Bertha, Minn., and Sinclair Lewis.

JOHN HOWLAND

The Council on Pharmacy and Chemistry publishes an appreciation of John Howland. By the death of John Howland, the Council has sustained a great loss; for he was a member whose devoted services were much valued and whose contributions to the scientific progress of medicine have been outstanding. The members of the Council mourn the loss of their colleague, and point to his services as an inspiration for all. (Jour. A. M. A., Aug. 14, 1926, p. 491.)

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

The annual meeting of the Southern Minnesota Medical Association will be held this year at Mankato, Minnesota, and will consist of a one day session, Monday, October 18. The morning session will be devoted to presentation of case abstracts by members of the Association followed by clinical demonstrations and papers. Governor Theodore Christianson will speak at the noon luncheon.

At the banquet to be served following the afternoon session the principal speakers will be Dr. Herman Johnson, President of the Minnesota State Medical Association, Dr. W. T. Coughlin, St. Louis, Missouri, and Dr. H. Winnett Orr, Lincoln, Nebraska.

Officers of the Association are: President, Dr. F. R. Huxley, Faribault; first vice president, Dr. J. S. Holbrook, Mankato; second vice president, Dr. A. H. Logan, Rochester; secretary-treasurer, Dr. H. T. McGuigan, Red Wing. Dr. A. G. Liedloff of Mankato is chairman of the Committee of Arrangements and Dr. J. T. Schlesselman of Mankato has charge of the Committee on Entertainment.

Program

8:30- 8:40	Session opens. Preliminary announcements.
8:40- 9:20	Presentation of Case Abstracts by Members of Association.*
9:20-10:00	Clinical Demonstrations of Cases of Diabetes Mellitus. A. E. Sohmer, M.D., Mankato, Minn., and H. J. Lloyd, M.D., Mankato, Minn.
10:00-10:25	Periodic Health Examination, Practical Demonstration. A. M. Snell, M.D., Rochester, Minn.
10:28-10:43	Recent Observations Concerning Urinary Tuberculosis. G. J. Thomas, M.D., Minneapolis, Minn., Asst. Prof. Urology, Univ. of Minn.
10:45-11:00	*X*-ray of Bones in Pediatrics. T. L. Birnberg, M.D., St. Paul, Minn.
11:03-11:18	Treatment of Otitis Media in Infants and Children. C. W. Rumpf, M.D., Faribault, Minn.
11:20-11:30	Discussion of Two Preceding Papers. F. W. Schlutz, M.D., Minneapolis, Minn., Prof. of Pediatrics, Univ. of Minn.
11:33-11:48	The Control of Infections in Injuries to Bones and Joints. (Motion Pictures) H. W. Orr, M.D., Lincoln, Nebraska.
11:50-12:05	State Medicine in Germany. G. Schnarruberger, M.D., Rollingstone, Minn.
12:15-12:25	The Nature of Glossitis in Pernicious Anemia. J. P. Schneider, M.D., Minneapolis, Minn., Asst. Prof. of Medicine, Univ. of Minn.
	LUNCHEON
1:30- 1:45	President's Address. F. R. Huxley, M.D., Faribault, Minn.
1:48- 2.03	Ileostomy in Acute Peritonitis. C. J. Holman, M.D., Mankato, Minn.

*The Program Committee urges the members of the Southern Minnesota Medical Association to bring in case abstracts of not over one hundred words, such abstracts to be presented by the doctor himself, or, if he wishes, by the presiding officer. The following men will discuss the various phases of cases.

Internal Medicine by Dr. J. P. Schneider; Pediatrics by Dr. F. W. Schlutz; Orthopedic Surgery by Dr. H. W. Orr; Neurology by Dr. G. B. Kamman; Neurological Surgery by Dr. A. W. Adson; Genito-Urinary Surgery by Dr. G. J. Thomas; General Surgery by Dr. Edmund Andrews.

2:05- 2:20 Alcohol and Its Effect on the Nervous System.
G. R. Kamman, M.D., St. Paul, Minn., Asst. in Dept. of Nervous and Mental Diseases, Univ. of Minn.

2:23- 2:38 Title to be announced.
W. T. Coughlin, M.D., St. Louis, Mo., Prof. of Surgery, St. Louis University.

2:40- 2:55 Rectal Complications in Pregnancy.
W. A. Fansler, M.D., Minneapolis, Minn.

3:00- 3:15 Cancer Problems.
W. J. Mayo, M.D., Rochester, Minn.

3:18- 3:33 Intravenous Therapy.
J. A. McIntyre, M.D., Owatonna, Minn.

3:35- 3:50 Surgical Treament of Gastric and Duodenal Ulcer.
R. C. Coffey, M.D., Portland, Ore., Pres. Western Surgical Association.

3:53- 4:08 Difficulty of Adjustment During the Adolescent Period.
G. Donohoe, M.D., Cherokee, Iowa, Supt. Cherokee State Hospital.

4:10- 4:25 Immunization Against Scarlet Fever and Diphtheria with Detoxified Toxin.
W. P. Larson, M.D., Minneapolis, Minn., Prof. of Bacteriology, Univ. of Minn.

4:28- 5:20 A Symposium on Surgery of the Sympathetic Nervous System in the Treatment of Vascular Disturbances.
E. Andrews, M.D., Chicago, Ill., Asst. Prof. of Surgery, Univ. of Illinois.
A. W. Adson, M.D., Rochester, Minn.
G. E. Brown, M.D., Rochester, Minn.

5:20 Business meeting with Election of Officers.

INTER STATE POST GRADUATE ASSEMBLY OF NORTH AMERICA

The annual meeting of the Inter State Post Graduate Assembly will be held in the Municipal Auditorium at Cleveland, October 18 to 22 inclusive. Pre-assembly clinics will be held in the Cleveland hospitals October 14 to 16 inclusive. All members of state or provincial societies are eligible to membership and are cordially invited to attend the meeting in Cleveland.

Clinics will begin at 7 a. m. daily and will continue throughout the morning, afternoon and evening. Clinics and addresses will be furnished by well known authorities not only from the United States but from Canada and abroad.

MINNEAPOLIS SURGICAL SOCIETY

The first meeting of the 1926-1927 session of the Minneapolis Surgical Society will be held Wednesday, October 13, at the library rooms of the Hennepin County Medical Society, in the Donaldson Building, Minneapolis, at eight o'clock in the evening.

The speaker of the evening will be Dr. Robert C. Coffey, of Portland, Oregon. His address will be on the subject "Surgical Treatment of Cancer of the Rectum." All physicians are cordially invited.

STEARNS-BENTON COUNTY MEDICAL SOCIETY

Twenty-nine members were present at the August meeting of the Stearns-Benton County Medical Society, which was held at Paynesville, Minnesota, Thursday, August 26, 1926. Dr. P. C. Pilon acted as host to the members of the society at dinner, which was followed by a scientific program, composed of the following papers:

Double Empyema of the Antrum—Dr. Thomas Fleming, St. Cloud.

Discussion: Dr. J. J. Gelz, St. Cloud.

Trichinosis—Dr. F. S. Richardson, Belgrade.

Acute Abdomen—Dr. R. N. Jones, Richmond.

Discussion: Dr. Charles F. Brigham, St. Cloud.

Demonstration of Specimens—Dr. P. C. Pilon, Paynesville.

The September meeting was held at Clearwater, Thursday, September 23, members of the society being the guests of Dr. E. M. Kingsbury.

MINNESOTA ACADEMY OF MEDICINE

At the meeting of the Minnesota Academy of Medicine held September 15 at the Town and Country Club, St. Paul, the following officers were elected for the coming year: President, Dr. Frank E. Burch, St. Paul; vice president, Dr. John E. Hynes, Minneapolis; secretary-treasurer, Dr. Carl B. Drake, St. Paul.

TRAVEL STUDY CLUB OF AMERICAN PHYSICIANS

At the completion of its recent European Study Tour, the Travel Study Club of American Physicians elected Dr. Fred H. Albee of New York as President, Drs. Edward B. Heckel of Pittsburgh and John P. Lord of Omaha as Vice-Presidents, and Dr. Richard Kovacs of New York as Secretary.

Plans are being prepared for the next study trip, including the Central European countries: Germany, Austria, Czechoslovakia, Hungary and Italy.

CAMP RELEASE MEDICAL SOCIETY

The annual meeting of the Camp Release District Medical Society was held at Granite Falls, Friday afternoon and evening, September 3.

The officers elected for the ensuing year were: President, Dr. A. A. Passer, Olivia; vice president, Dr. M. A. Burns, Milan; secretary-treasurer, Dr. L. H. Holmberg, Canby (re-elected).

Following the election the scientific program was given. Dr. J. T. Christison, of St. Paul, held a pediatric clinic and followed with an address on "Problems on Infant Feeding." Dr. S. Franklin Adams, of the Mayo staff, Rochester, gave a clinic on Cardio-vascular-renal Disease, and Dr. George B. Eusterman, of the Mayo Clinic, held a clinic on Gastro-intestinal Disturbances. Following the dinner, which was served at 7 p. m., Dr. Eusterman gave an interesting address on the subject of Gastro-intestinal Diseases, including Cancer, illustrated by lantern slides.

Camp Release is one of the largest societies of the state, including Sibley, Chippewa, Renville, Lac Qui Parle, and Yellow Medicine counties.

OF GENERAL INTEREST

Dr. Hamline Mattson has announced the opening of offices at 808 Physicians and Surgeons Building, Minneapolis.

Dr. I. D. Tiedemann, formerly of Heron Lake, is now located in Champaign, Illinois, where he moved early in September.

Dr. George McL. Waldie, formerly superintendent of the Buena Vista Sanatorium at Wabasha, Minnesota, is now associated with the Houghton County Sanatorium, Houghton, Michigan.

Dr. Lloyd H. Ziegler, who has been associated with the Section of Neurology, Mayo Clinic, Rochester, has become a member of the staff of the Colorado Psychopathic Hospital, Denver, Colorado.

Dr. A. C. Strachauer, of Minneapolis, has gone East to attend the International Cancer Symposium, which is being held at Lake Mohonk, N. Y., under the auspices of the American Society for the Control of Cancer.

Dr. Frœdrich von Müller, Professor of Clinical Medicine, University of Munich, was in Rochester the week of September 20 to give a series of Mayo Foundation lectures on various medical subjects, including goiter, postencephalitis, gout, and nephritis and nephrosis.

Dr. Edouard Rist of Paris and Sir Henry Gauvain of Alton, England, will come to Rochester the middle of October to give Mayo Foundation lectures. Both men are coming to this country to attend the International Tuberculosis Congress and the meeting of the National Tuberculosis Association.

Dr. Lee Monroe Miles has recently returned to the United States from an eight year's sojourn in China. Dr. Miles spent four years in the Mission Hospital in Shantung province and for the past four years was Associate in Obstetrics and Gynecology at Peking Union Medical College, Rockefeller Foundation. Dr. Miles has opened offices in the Hamm building in St. Paul for the practice of his specialty.

Construction of the new clinic building at the Mayo Clinic, Rochester, is now under way. The site is adjacent to the old clinic building, which will be used for administrative purposes. The design of the building is a modern adaptation of Romanesque architecture. The first two stories will be of stone. Eight floors of the building will be used largely for clinical examination. The eleventh floor is to be given over to library use and the twelfth floor will be principally a large assembly room.

Dr. C. N. Hensel, who has been abroad since April, has returned to his practice in St. Paul. Dr. Hensel spent some time in Hamburg, Munich and the Austrian Alps. The major part of his time, however, was occupied with postgraduate study in the medical school of the University of Vienna. Dr. Joseph Gehlen, who had charge of Dr. Hensel's practice in his absence, will continue the practice of internal medicine as an associate of Dr. Hensel.

Dr. Leo G. Rigler of Minneapolis left the first of September for Stockholm, Sweden, where he will do postgraduate work for a year under the direction of Dr. Gosta Forssell. Dr. Rigler is to be succeeded in his work as director of the *X*-ray Department of the Minneapolis Clinical Association by Dr. Walter H. Ude, formerly head of the *X*-ray Department at the Northern Pacific Hospital, St. Paul. Dr. Ude was associated with Dr. Rigler at the General Hospital in Minneapolis and will succeed him there as Roentgenologist.

HEALTH DAYS IN SOUTHERN MINNESOTA

The Minnesota State Medical Association, through Dr. George Earl, Health Day sub-chairman of the Public Health Education Committee, and Dr. E. A. Meyerding, state secretary, has arranged for a series of four Health Day programs to be given in Southern Minnesota cities with the purpose of acquainting the public with the truth about health.

Coöperating in promoting the program will be: the Minnesota Public Health Association, State Board of Health, University of Minnesota Medical College, and the Minnesota State Medical Association.

The four cities visited, which will draw from the surrounding communities, will be Blue Earth, October 26; Fairmont, October 27; Pipestone, October 28, and Worthington, October 29.

Physicians will be brought to each place to give short talks on pre-natal hygiene, vaccination as a disease preventive and other health topics.

Morning programs will be largely for the children in schools, where Chew Chew, the Health Clown, will give them his own form of "lectures" on how to retain soundness of body. During the afternoon and evening meetings health exhibits will be shown and films thrown upon the screen illustrating facts pointed out in the talks. A health playlet and other instructive entertainment will be among the incidental features.

Strong local committees have been appointed in each city consisting of many of the most prominent citizens who show marked enthusiasm to have the Health Day program an unqualified success.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

THE GILLILAND LABORATORIES, INC:

Antistreptococcic Serum, 20 c.c.

LEDERLE ANTITOXIN LABORATORIES:

Poison Oak Extract-Lederle (In Almond Oil)

Poison Oak Extract-Lederle (In Almond Oil), 1 c.c.

LEHN & FINK, INC.:

Pituitary Substance-L. & F. Desiccated

Tablets Pituitary Substance-L. & F. Desiccated, 0.5 grain

Anterior Pituitary-L. & F. Desiccated

Tablets Anterior Pituitary-L. & F. Desiccated, 1 grain

Posterior Pituitary-L. & F. Desiccated

Tablets Posterior Pituitary-L. & F. Desiccated. 0.1 grain

ELI LILLY & COMPANY:
Diphtheria Antitoxin, Purified, Concentrated-Lilly
H. K. MULFORD COMPANY:
Ivyol
Hypo United Ivyol, 0.7 c.c.

E. R. SQUIBB & SONS:
Erysipelas Streptococcus Antitoxin Concentrated-Squibb, 15 cc.

Ivyol.—A solution in olive oil of an irritant or vesicant oil extracted from the fresh leaves of poison ivy. Ivyol is used to relieve the symptoms of the dermatitis produced through contact with poison ivy. It is marketed in "Hypo Units," collapsible syringe containers, each containing 0.7 c.c. of ivyol. H. K. Mulford Co., Philadelphia.

Pituitary Extract-Lederle 20 Units.—A slightly acid aqueous solution containing the water-soluble principle or principles of the fresh posterior lobe of the pituitary body of cattle, free from preservative. It is standardized to have twice the strength of solution of pituitary-U. S. P. X. For a discussion of action, uses and dosage, see New and Non-official Remedies, 1926, pp. 281 and 283. The product is supplied in 1 c.c. ampules. Lederle Antitoxin Laboratories, New York. (Jour. A. M. A., Aug. 14, 1926, p. 491.)

Erysipelas Streptococcus Antitoxin.—An antitoxic serum prepared by immunizing animals against the toxin of the hemolytic streptococci of erysipelas. Reports have been published which indicate that the injection of erysipelas streptococcus antitoxin favorably affects the course of erysipelas.

Erysipelas Streptococcus Antitoxin-Mulford.—This antitoxic serum is obtained by injecting horses intradermally with strains of hemolytic streptococci isolated by H. Amoss from human cases of erysipelas lesions, bleeding the horses, and, when test bleedings show the serum to have reached the desired potency, separating the serum, sterilizing and preserving it. The product is marketed in 100 c.c. vials. H. K. Mulford Co., Philadelphia.

Oscodal.—A preparation of the non-saponifiable fraction of cod liver oil, containing the antiophthalmic and antirachitic fat-soluble vitamins. It has 500 times the antiophthalmic potency of cod liver oil when assayed by the method of the U. S. P. for cod liver oil, and its antirachitic potency is such that 0.02 Gm. per day will initiate recalcification in the leg bones of young albino rats. Oscodal possesses properties similar to those of cod liver oil so far as these depend on the fat-soluble vitamin content of the latter. Oscodal is supplied in tablets containing 0.02 Gm. H. A. Metz Laboratories, Inc., New York.

Pituitary Substance-L. & F. Desiccated.—The pituitary gland of cattle, including the infundibulum and the anterior and posterior lobes, dried and powdered. For a discussion of the actions and uses, see Pituitary Gland, New and Non-official Remedies, 1926, p. 281. The product is also supplied in 1.5 grain tablets. Lehn & Fink, Inc., New York.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

GYNECOLOGY AND OBSTETRICS

SUPERVISORS:
ARCHIBALD L. McDONALD,
FIDELITY BLDG., DULUTH
L. W. BARRY,
LOWRY BLDG., ST. PAUL

MATERNAL MORTALITY; THE RISK OF DEATH IN CHILDBIRTH AND FROM ALL DISEASES CAUSED BY PREGNANCY AND CONFINEMENT: Robert Morse Woodbury (U. S. Department of Labor, Children's Bureau Publication No. 158). Recently there has appeared a publication from the Children's Bureau, United States Department of Labor, Bureau Publication No. 158, price twenty-five cents. The complete title of this publication is "Maternal Mortality; the Risk of Death in Childbirth and from All Diseases Caused by Pregnancy and Confinement," by Robert Morse Woodbury.

Dr. Woodbury has made an extensive statistical study and analysis of factors entering into puerperal mortality. He has published these analyses in this pamphlet of 163 pages which is carefully arranged and also well indexed.

The author has brought together the available statistical material of this country and of foreign countries. He considers the high mortality rates in the United States and finds that they are among the highest in the civilized world and that there has been but a slight decrease in these rates since the beginning of the present century. The significance of these facts is of national importance, due to the loss of the lives of many women who are in their prime and the associated loss of infant lives. The author states that a considerable proportion of infant deaths under one year of age occur during the first month of life, and approximately 100,000 infants die annually under one month of age. He also states that about 100,000 stillbirths occur annually, and concludes that the same measures that should be instituted to save the lives of mothers will also contribute toward the saving of these fetal lives. The author states the annual number of maternal deaths on the basis of the 1921 birth-registration area to be 18,281. He thinks probably that the error in these cases is about 12 per cent, which would make the actual number nearer 20,000 women. The maternal mortality rate for 1921 was 6.8 per 1,000 live births, and the provisional rate for 1924 was 6.6. The trend of the maternal mortality rate since 1900 shows an increase

from 13.3 per 100,000 population in 1900 to 16.9 in 1921. The comparison with other countries shows that the United States ranks with those having the highest rates, such as New Zealand and Chile. Among the countries having less than half this rate are Denmark, Finland, Italy, Japan, the Netherlands, Norway, Sweden, and Uruguay.

The author also considers the causes of maternal mortality. He considers the economic factors, compares the city and country rates, and concludes that maternal mortality is largely preventable. He makes certain recommendations for the prevention of maternal mortality and outlines the following preventive program:

(1) Regulation of the practice of obstetrics, by requiring a license to practice from both physicians and midwives, by establishing minimum requirements for obtaining such a license, and by defining and prescribing penalties for malpractice.

(2) Regulation of public and private hospitals and maternity homes through legal provisions governing the establishment of such institutions and requiring that they be licensed and subject to inspection.

(3) Legislation for the control of venercal diseases including the making of these diseases reportable.

(4) Requiring that puerperal septicemia be made reportable, as is now the case in a number of States.

(5) Provision through Governmental or public sources of better facilities for training medical and nursing personnel and more adequate clinics, hospitals, and maternity homes.

(6) Subsidies in aid of State or local activities by Federal or State governments, as in the United States during the past four years through the Maternity and Infancy Act.

(7) Educational work directed toward informing mothers of the need of adequate maternity care.

FRED L. ADAIR, M.D.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS

ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

THE DIAGNOSIS OF INCIPIENT TUBERCULOSIS IN CHILDREN: Wm. Henry Donnelly, M.D. 1926). Little has been said or written that is helpful in diagnosing tuberculosis in children. The diagnosis of tuberculosis in its incipiency in children still remains an enigma. It is logical to believe that childhood tuberculosis is the forerunner of the adult type. Tuberculosis in adults is in the fullest sense of the word a children's disease.

That a positive tuberculin test reveals a latent tuberculous infection is unquestioned. It is also conceded that a positive tuberculin test in an infant and very young child usually implies an active tuberculous process. Tuberculosis of childhood, particularly between the ages of 5-10 years, is a disease of the lymph glands, involving mostly the tracheobronchial glands. Apical lesions rarely occur before 10 years of age. If one awaits the presence of physical signs in the chest and tubercle bacilli in the sputum to diagnose tuberculosis in childhood, he will diagnose the advanced cases.

X-ray helps us little in the diagnosis of incipient hilum tuberculosis. It is well to remember that there are many causes for tracheobronchial adenitis, as whooping cough, measles, bronchopneumonia, influenza, chronic bronchitis, lues, Hodgkin's, asthma.

Those with an incipient tuberculous infection were well nourished. John Lovett Morse states that tuberculosis is seldom the cause of malnutrition. The role that bovine infection plays in tuberculosis has been greatly exaggerated at the expense of contact infection.

Debre concludes that we should always suspect tuberculosis in an infant or child if another member of the family has it. Too much time and space cannot be devoted toward emphasizing the importance of the spread of tuberculosis by human contact.

R. N. ANDREWS, M.D.

CALCIUM LACTOPHOSPHATE IN ACETONEMIC VOMITING: Crawford R. Green, M.D. (Archives of Pediatrics, August, 1926). In making this report regarding what the author believes to be the cure for cyclic or acetonemic vomiting, he does not intend to burden you with any consideration of the treatment of the attack itself. The continued nausea and vomiting which persists for hours and days; the inability to retain anything, even water, except by the rectal route; the frightful exhaustion of the patient; the panic of the parents and the dismaying futility of our efforts to give relief are well known conditions.

For the most part our so-called preventive treatment has hitherto consisted of two factors: (1) the reduction of the intake of fat in the diet, particularly milk fat; (2) the regular administration of sodium bicarbonate, which is usually given in doses about 20 grains twice or thrice daily over a long period of time.

There seems to be an association between cyclic vomiting and migraine, and it is stated by most observers that the child who is a cyclic vomiter has the unhappy outlook of becoming a subject of migraine in later life.

In March, 1920, the author began the administration of calcium lactophosphate, two grains three times daily. This treatment was continued without interruption for about twenty months. There were no attacks after the beginning of treatment in the case which was under treatment. Many other cases were treated with calcium lactophosphate with the same result.

The cases that the author reported are all cases in which the diagnosis has been proved and which have been under observation long enough to warrant a definite conclusion as to the outcome. He has treated no patient in which the result has not been entirely successful, and from among the physicians whom he has endeavored to interest in the treatment, no failures have yet been reported to him.

R. N. ANDREWS, M.D.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

Cannula Implants and Review of Implantation Technics in Esthetic Surgery. Charles Conrad Miller, M.D. 178 pages. Illus. Cloth, $2.50. Chicago: Oak Press, 1926.

Electrothermic Methods (Desiccation and Coagulation) in the Treatment of Neoplastic Diseases. J. Douglas Morgan, B.A., M.D., formerly Radiologist, Ross Pavilion, Royal Victoria Hospital, Montreal. 172 pages. Illus. Cloth, $2.50. Philadelphia: F. A. Davis Company, 1926.

Surgery of Neoplastic Diseases by Electrothermic Methods. George A. Wyeth, M.D., New York 298 pages. Illus. Cloth, $7.50. New York: Paul B. Hoeber, 1926.

The Duodenal Tube and Its Possibilities. Max Einhorn, M.D. 2nd edition, revised and enlarged. 206 pages. Illus. Cloth, $3.00. Philadelphia: F. A. Davis Company, 1926.

Practical Materia Medica and Prescription Writing. Oscar W. Bethea, M.D., Ph.G., F.C.S. 4th revised edition. 498 pages. Illus. Cloth, $4.50. Philadelphia: F. A. Davis Company, 1926.

LIFE INSURANCE EXAMINATION. Frank W. Foxworthy, M.D. 738 pages. Illus. Cloth $9.00. St. Louis: C. V. Mosby Co.

This book is by fifty authors, dealing with all phases of the medical side of life insurance. For the most part the writers are medical directors of the large insurance companies, but the mortality figures, for instance, are presented by an actuary, the chapters on postoperative risks by surgeons, while a lawyer discusses the legal aspects of the examination.

It is a very comprehensive work, including within its scope a history of insurance, the organization of medical departments and many hundred pages on the technic of examination. There are chapters on group insurance, industrial insurance, fraternal and health and accident insurance, on tropical insurance and the insurance of sub-standard risks.

Then there are chapters dealing with the effect of each disability on the life expectancy of the applicant. This information comes from a trieless study of statistics. The length of life, for instance, varies inversely as the length of the waist line and the men who are 50 pounds overweight, will after the age of 30, show a constantly increasing mortality, until at the age of 58 they are dying at a rate of 7 years ahead of their normal expectancy. Similar statistics show the effect of alcoholism, the tuberculous family history and hazardous occupations.

Thus, although essentially a guide for examiners, this book contains valuable instruction for any doctor in the fine art of prognosis.

G. E. Harmon, M.D.

MODERN METHODS OF AMPUTATION. Thomas G. Orr, Professor of Surgery, University of Kansas, St. Louis: C. V. Mosby, 1926.

Dr. Orr's manual on Modern Methods of Amputation is concise and thorough. The subject is well illustrated and orderly arranged; no time or space is lost discussing non-essentials. The author stresses, first, the general field of amputation and the treatment of muscle, fascia, nerve, etc. This is followed by a chapter devoted to the upper extremity and another chapter to the lower extremity. Cinemate-plastic amputation is considered in a brief but instructive manner, very well illustrated. The closing chapter, devoted to the study of artificial limbs and the importance of proper fiting, illustrated with interesting drawings and photographs, adds to the value of this book.

Modern Methods of Amputation is well done; it presents the subject in an interesting and intelligent manner and leaves the reader better prepared to cope with the problem of amputation. The author deals with the essentials and stresses the importance of amputation with function.

A. E. Flagstad, M.D.

OPERATIVE SURGERY. J. Shelton Horsely, M.D., F.A.C.S., Attending Surgeon, St. Elizabeth's Hospital, Richmond, Virginia. Cloth. Price $12.50, 784 pages with 666 original illustrations. St. Louis. The C. V. Mosby Company, 1924.

This work covers the field of operative surgery in a very comprehensive manner. The text is to the point and is ably augmented by very artistic and instructive illustrations.

This is a very practical book and would be a valuable addition to the library of any physician or surgeon.

E. M. Jones, M.D.

WANTED—Salaried appointments for Class A physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

FOR RENT—Office space for physician in well furnished office, Lowry Building, Saint Paul. Waiting and examining room, telephone, light, $35.00 a month. Address C-94, Minnesota Medicine.

WANTED—Locum tenens or assistantship by experienced physician licensed in Minnesota. Address C-95, care Minnesota Medicine.

Minnesota State Medical Association

FIFTY-EIGHTH ANNUAL MEETING

May 17, 18 and 19, 1926

SAINT PAUL, MINNESOTA

PROCEEDINGS OF THE HOUSE OF DELEGATES. FIRST MEETING—MAY 17, 1926

The first session of the House of Delegates was called to order at two-fifteen p. m. by the President, Dr. H. M. Johnson.

THE SECRETARY (Dr. E. A. Meyerding): The President has appointed a Credentials Committee consisting of the following: Drs. Hunt, Will, Adams, LaVake and Albert Schulze.

THE PRESIDENT: There is one thing that we want to impress upon each and every one of you, that is that the discussions here are not for publication. We also want to see that there is no one here who is not a member of the profession. We have a Sergeant-at-Arms at the door.

The first thing in order will. be acceptance of the minutes of the last session as transcribed by the official reporter and published in MINNESOTA MEDICINE for July, 1926.

DR. W. A. JONES (Minneapolis): I move they be accepted and considered read and adopted.

The motion was seconded by Dr. H. M. Workman and carried unanimously.

THE PRESIDENT: Next is the report of the Chairman of the Council.

Dr. H. M. Workman, Chairman of the Council, read his report, which was adopted on motion regularly made and seconded, carried unanimously.

REPORT OF THE COUNCIL

The meeting of the council was held May 17, 1926. in the office of the Secretary, 11 West Summit Avenue, Saint Paul.

Members present:

Drs. H. M. Workman, G. S. Wattam, J. G. Millspaugh, F. J. Savage, W. H. Condit, L. Sogge, F. A. Dodge, W. F. Braasch, E. A. Meyerding, Earle R. Hare, W. A. Coventry.

Meeting called to order by Dr. Workman.

Dr. Savage brought up the matter of the Constitution. Same was read and discussed at length by the Council, and it was to be presented to the House of Delegates at the afternoon meeting.

The Secretary, Dr. Meyerding, had an opinion from Mr. Oppenheimer, Council for the State Association, in which he stated that the Constitution could not be adopted at this session, but must lay over for a year; that same could be presented at this session; that the By-laws after being read at one meeting may be adopted at the next.

Dr. Charles Bolsta reported on the Basic Science Bill, and it was the opinion of the Council that it be presented to the House of Delegates as it stood.

A letter from the American Medical Association in regard to the Narcotic Bill was read, and referred to the House of Delegates with a recommendation that it be referred to the Legislative Committee.

The treasurer's report was read by Dr. Earle R. Hare. Motion was made, seconded and carried that it be adopted subject to the report of the auditor.

It was suggested that the books of the Secretary and Treasurer be audited up to the first of January, 1926.

THE PRESIDENT: Next is the Secretary's report, with the report of the attorneys included.

THE SECRETARY: We have just had a telegram that will be interesting to all of you, addressed to the Secretary of the Minnesota Medical Association:

> "His Excellency the Governor Alfred Smith signed amendment to medical practice act eleven-fifteen this evening, Chapter 834, Laws of 1926. We now have in this state what may be fairly considered a model medical practice act.
>
> "(Signed) Augustus Downing, New York."

The Secretary read his report, and the report of the attorneys for the period from April, 1925, to April, 1926.

REPORT OF THE SECRETARY

Active membership of this Association May 15, 1926, was 1,919.

Following is a list of the membership by Societies:

Blue Earth County	28
Blue Earth Valley	22
Camp Release District	40
Central Minnesota District	18
Chisago-Pine County	17
Clay-Becker County	15
Dodge County	7
Freeborn County	19
Goodhue County	17
Hennepin County	458
Houston-Fillmore	25
Kandiyohi-Swift	15
Lyon-Lincoln County	19

McLeod County	14
Meeker County	8
Mower County	24
Nicollet-LeSueur County	17
Olmsted County	224
Park Region	34
Ramsey County	320
Red River Valley	53
Redwood-Brown	23
Rice County	28
Saint Louis County	167
Scott-Carver	19
S. W. Minnesota District	51
Stearns-Benton	47
Steele County	14
Upper Mississippi	64
Wabasha County	12
Waseca County	12
Washington County	14
Watonwan County	6
West Central	27
Winona County	23
Wright County	18

On December 31, 1926, the total membership numbered 2,013, and it will, no doubt, exceed that number by the end of this year.

LOCAL SOCIETIES VISITED

During the past year your secretary has visited the following Medical Societies and towns on business of the State Medical Association:

Camp Release District Medical Society.
Southwestern Minnesota Medical Society.
Freeborn County Medical Society.
Mower County Medical Society.
Winona County Medical Society.
Steele County Medical Society.
Waseca County Medical Society.
Wabasha County Medical Society.
Goodhue County Medical Society.
Rice County Medical Society.
Scott-Carver County Medical Society.
Ramsey County Medical Society.
Hennepin County Medical Society.
Chisago-Pine County Medical Society.
Blue Earth County Medical Society.
Nicollet-LeSueur County Medical Society.
Park Region District Medical Society.
Upper Mississippi Medical Society.
Northern Minnesota Medical Society.

Numerous trips were made to Minneapolis to attend meetings of the University Extension Committee and other Association matters. Visits were made to New Ulm, Tracy, Minneota, Marshall, Rochester (several times) and Chicago twice (A. M. A. and Secretaries' Conference). Calls were made on Dr. Oppegaard, Crookston, Secretary of the Red River Valley Medical Society; Dr. H. M. Johnson at Dawson, Dr. Wattam at Warren, Dr. Millspaugh at Little Falls and Dr. Hirschboeck at Duluth. In addition your secretary has made numerous other visits in the interest of the State Association in other parts of the State.

We have always felt the necessity and importance of having a permanent headquarters for the State Association. Nevertheless, our experience has been a surprise to us. The volume of business and matters that seemed important to the members of the profession were beyond our conception.

UNETHICAL PRACTICE

Numerous communications have been received relative to the privileges of the cults, licensed medical quacks, Indian healers, conviction of medical men for practice of optometry, and many other similar questions.

Your secretary gives the inquirers such information as he has available and refers the letters to the proper legal source, such as the State Board of Medical Examiners and the various committees of the Minnesota State Medical Association. Our counsel, Mr. Oppenheimer, has frequently given us legal opinions upon these questions without charge. In addition, we are compiling considerable information in the office.

SPECIAL ASSESSMENT

Special assessment of $5.00 has been collected from 2,027 members. It will be noted that instead of a decrease in membership there has been an increase.

COMMITTEES

The Medical profession can be justly proud of the activity of its members. Your committees have held numerous sessions, with the majority of the members present at each session. They have served faithfully without regard for time or expense.

The officers and committees have tried to do everything possible to make the meeting a success. Suggestions and constructive criticism calculated to make future meetings more useful will be welcomed by any of the officers.

COMPONENT SOCIETIES

There seems to be a marked increase in interest in the Component Societies, both in number of meetings held and the attendance of its members. This should be encouraged, as the strength of the State Association depends upon its component units.

NEW TYPES OF MEETINGS

Two new types of meetings have been held in many parts of the State.

1. The Medical Economic Meetings, which should be repeated at least annually, and
2. The Scientific Meetings, where the local men read the papers and the visitors conduct the discussion.

These two features with the supper or dinner have made most attractive programs.

MINNESOTA PUBLIC HEALTH ASSOCIATION

It would not have been possible to carry on our activities to date if it had not been for the Minnesota Public Health Association placing its resources at the service of the medical profession.

The secretary desires to acknowledge the hearty coöperation and assistance of all members of the Association, especially of its officers, the President, Dr. H. M. Johnson, the first vice president, Dr. W. F. Braasch, and the treasurer, Dr. Earle R. Hare.

GENERAL FUND

January 1, 1925-December 31, 1925

	Amount Appropriated	Disbursements	Deficit	Credit
Medical Defense	$4,026.00	$4,778.49	$ 752.49	
Minnesota Medicine	4,026.00	13,040.73		$1,410.65
Note: Minn. Med. turned over to MSMA $10,425.38.				
ADMINISTRATION	$2,013.00			
Salaries and MPHA		3,100.00		
Annual Meeting		1,020.20		
Legislation		500.00		
Radio and Publicity		57.00		
Council Expense		171.35		
Miscellaneous: Steno., printing, postage, etc.		740.13	3,575.68	

		Receipts	Disbursements
Total Amount Collected 1925 as follows		$29,627.74	
Minnesota Medicine	$10,425.38		
Medical Protective	1,000.00		
Special Assessment	8,115.00		
Dues	10,086.00		
Miscellaneous (Post Cards)	1.36		
	$29,627.74		
Total Amount Spent 1925 as follows			$25,888.77
MSMA General	$10,367.17		
Revolving Fund	100.00		
Minnesota Medicine	13,040.73		
Educational	2,380.87		
	$25,888.77		
			Credit $3,738.97

EDUCATIONAL FUND

May 1925-Dec. 31, 1925	$8,115.00	$1,380.87	$6,734.13
Jan. 1926-April 30, 1926	1,860.00	258.08	1,601.92
Total	$9,975.00	$1,638.95	$8,336.05

Note: To date (May 15) we have collected $10,135 in special assessment.

REPORT OF ATTORNEYS

April 1925 - April 1926.

Evju v. Meckstroth.—Plaintiff had suffered a fracture of the tibia and fibula, and had been cared for by Dr. Meckstroth until May 18, 1923. On July 1, 1923, plaintiff went to Fergus Falls and Drs. Baker and Burnap performed an operation inserting a plate after finding malunion and an unreduced fracture. This case was settled in the sum of $3,500.00.

Flynn v. O'Hara.—The charge of malpractice in this case is in producing lacerations, with resulting infection in the treatment of Manda Flynn in childbirth. The action has been tried once, but the court granted a new trial. On October 14, 1925, we received word from Mr. L. D. Rogers, attorney at law, that his motion to dismiss the case was granted and as the statute of limitations had run, that is the end of the case.

Walrath v. Hammermeister.—As a result of alleged malpractice there occurred paralysis of the right leg and foot, plaintiff claiming damages in the sum of $25,000.00. This action was dismissed for want of prosecution.

McCoy v. Johnson.—Action brought by Dr. McCoy to recover $75.00 fees. A counterclaim was interposed alleging negligence in an attempt to care for and heal a mangled and injured left hand; $6,893.00 asked. This case has been settled by the patient paying a reduced fee.

Hunt v. Reihs.—Drs. Hunt and Hunt brought suit for their fees and the defense of malpractice was interposed. The malpractice in the pleadings is not specifically stated and the charge seems to be without a foundation. This action is still pending.

Schoenbachler v. Anderson.—Alleged negligence in lancing a boil or abscess, thereby causing an injury to the nerves; $20,000.00 damages sought. Action pending and on March 30th the Clerk of the District Court informed us that the same had never been put on the calendar for trial by plaintiff.

Pettit v. McGroarty.—Action started in District Court of Blue Earth County alleging negligence in diagnosing and treating a toxic condition, causing death of child eleven years of age; $7,500.00 asked. Settled for $500.00.

Gray v. Johnson.—Suit for professional fees and a counterclaim was interposed alleging malpractice in the treatment of an injured hand. The suit, including the counterclaim, was dismissed and nothing paid.

Backlund v. Burch and Connor.—Action brought in District Court, Ramsey County, alleging facial paralysis following a mastoid operation; $8,000.00 asked for. Case settled for $500.00.

Korman v. Hagen (First Case). — Tried in Waseca County. The alleged malpractice resulting from childbirth causing a breaking of the leg of the child and a paralysis to the arm. Verdict in the sum of $8,000.00 reduced by Supreme Court to $4,000.00.

Korman v. Hagen (Second case). — Action brought by father in the sum of $7,500.00 for loss of services of child and expenses incurred and to be incurred. Case settled for $625.00.

Anderson v. Ullrich.—Action brought in District Court, Hennepin County, alleging malpractice in the application of protoid tests. Action brought for the recovery of $22,000. Case still pending and probably will be reached this month.

Ritter v. Barber.—Action brought in District Court, Hennepin County, alleging malpractice in the failure to administer tetanus serum, all of which resulted in the death of the child. Action brought for the recovery of the sum of $11,500.00. The trial court directed a verdict for the defendant.

The attorneys also rendered services relative to legislation establishing a new Statute of Limitations for malpractice cases.

DR. WORKMAN: I move the adoption of the report of the Secretary and the report of the attorneys.

The motion was seconded by Dr. W. A. Jones and unanimously carried.

THE PRESIDENT: Next is the Treasurer's report.

The Treasurer, Dr. Earle R. Hare, read his report.

TREASURER'S REPORT

January 1-December 31, 1925

RECEIPTS

On hand January 1, 1925:		
Checks	$ 278.66	
Merchants National Bank	3.57	
Minnesota Transfer State Bank, O. D.		$ 145.24
Bonds and Mortgages	11,700.00	
Minnesota Medicine:		
Advertising	10,089.07	
Subscriptions	4,395.09	
Membership Dues	10,086.00	
Educational:		
Assessment	7,705.00	
Medical Protective	1,000.00	
Interest:		
Investments	649.00	
Bank Balances	58.04	
Sundries:		
Post Cards, Refunds, Etc.	76.68	
Vouchers Unpaid Dec. 31, 1925:		
Numbers 581, 609-17 inclusive	1,021.16	

DISBURSEMENTS

Minnesota Medicine		$13,050.63
Legal Expense		4,718.71
Convention Expense		1,060.70
Salaries		3,112.00
Sundries		897.00
Legislative Expense		500.00
Educational and Publicity Expense		2,399.65
Council Expense		200.34
General, Revolving Fund, Members' Subscriptions to Minnesota Medicine		4,177.35
On hand December 31, 1925:		
Merchants National Bank		3.57
Minnesota Transfer State Bank		5,097.08
Bonds and Mortgages		11,700.00
Totals	$47,062.27	$47,062.27

Respectfully submitted,
EARLE R. HARE,
Treasurer.

DR. WORKMAN: I move it be accepted.

The motion was seconded by Dr. Jones and unanimously carried.

THE SECRETARY: We have a partial report signed by the Credentials Committee: 60 Delegates should be here; 47 are present.

DR. W. A. JONES: I move the report be held over until tomorrow.

The motion was seconded by Dr. Workman and unanimously carried.

THE PRESIDENT: We will next have the report of the Editing and Publishing Committee.

Dr. John M. Armstrong will read the report.

Dr. Armstrong read the report.

REPORT OF THE EDITING AND PUBLISHING COMMITTEE
MINNESOTA MEDICINE

To the President and House of Delegates, Minnesota State Medical Association:

Your Editing and Publishing Committee is pleased to submit the following report for the ninth year of the publication of MINNESOTA MEDICINE:

During the period elapsing between the 1925 meeting and the present one, May 1, 1925, to April 30, 1926, twelve issues of MINNESOTA MEDICINE have been published containing 1,248 pages, an average of 104 pages for each month, the largest monthly average for any one year so far reported. Of these 1,248 pages, 720 were devoted to reading matter and 528 to advertising. The number of original articles and case reports shows a marked increase, numbering 150 in all, showing an average per month of 12.5. In the twelve issues have appeared 217 illustrations, an average of 18.1 per month.

The distribution of MINNESOTA MEDICINE each month is 2,650 copies and is divided approximately as follows:

Members	2000
Outside paid subscriptions	400
Miscellaneous (Advertising, free and filing copies)	250
	2650

The advertising pages have shown a nice increase for the year with a representation of approximately 110 firms. The total gross display advertising executed in the journal for the past year amounts to $9,869.03.

The total income for the year, including advertising, member and non-member subscriptions and miscellaneous amounts, is $16,985.11. The total expenditure, which includes a four months' supply of paper stock on hand, purchased last month, amounts to $15,480.50, leaving a net gain for the year of $1,504.61.

The publishers of MINNESOTA MEDICINE have recently purchased two other business publications which will enable them now to maintain a regular subscription man in all the Northwest states and we are hopeful that this will result in obtaining a number of additional subscribers to MINNESOTA MEDICINE in the states bordering Minnesota, particularly South and North Dakota.

Respectfully submitted,
EDITING AND PUBLISHING COMMITTEE,
R. E. FARR,
Chairman.
By J. M. ARMSTRONG,
Secretary.

DR. ARMSTRONG: I should like to say that this is not an audited report. The Constitution calls for an audit in October. Of course, this is May, so I presume it will be in order to refer this to the Finance Committee rather than the Auditing Committee, if that is satisfactory.

A motion was made, seconded, and unanimously carried that the report of the Editing and Publishing Committee be referred to the Finance Committee.

DR. W. A. JONES: On advice of counsel I wish to withdraw my motion, or ask that it be rescinded, and that we open the question again so that I may present it differently or that we may vote differently. I understand that it is illegal.

DR. W. A. BRAASCH: The point is made that in case this motion stands with respect to the report of the Credentials Committee, it will invalidate any vote which is taken today. In other words, the report of the Credentials Committee has to be accepted officially before any vote made today is legal. Therefore, the motion withdrawn will facilitate matters very much.

There was no objection to the withdrawal of the motion.

DR. JONES: Now, sir, I move that the report of the Credentials Committee be accepted and the Committee be continued.

The motion was seconded and unanimously carried.

THE PRESIDENT: We will next have the report of the A. M. A. Delegates.

DR. J. C. LITZENBERG: Dr. Rothrock will present the

report for the meeting of 1926, which I was unable to attend, and I will report for the 1925 meeting.

Dr. Litzenberg read the report for the 1925 meeting of the American Medical Association.

REPORT OF DELEGATES FROM THE MINNESOTA STATE MEDICAL ASSOCIATION TO THE HOUSE OF DELEGATES OF THE AMERICAN MEDICAL ASSOCIATION

President and House of Delegates of the Minnesota State Medical Society.

Gentlemen:

We, J. L. Rothrock, T. L. Chapman and J. C. Litzenberg, delegates of the Minnesota State Medical Society, to the House of Delegates of the American Medical Association, beg leave to submit the following report of the 1925 meeting of the American Medical Association.

Inasmuch as there have been two meetings of the American Medical Association since the last meeting of the Minnesota State Medical Society, and a whole year has elapsed since the 1925 meeting, we will submit a very brief report of that meeting:

The House of Delegates met in the Hotel Traymore, Atlantic City, New Jersey, at 10 a. m., May 25, 1925. Among the more important considerations were the following:

MEDICAL PUBLICITY

The House of Delegates under the leadership of Dr. Warnshuis, took the stand that the only successful method of combating quackery and cultism was through education of the public. The speaker, in his address to the House of Delegates, said: "Is the time not at hand when we accept this obligation and set forth to diffuse knowledge among the people by means of more extended effort than we have before manifested."

REPORT OF SECRETARY

The membership of the American Medical Association, April first, 1925, was 90,646—which is 590 more than the year before. Of this number, 56,121 are Fellows—a gain of 2,058 over the number last year.

REAPPORTIONMENT OF DELEGATES

The Committee on Reapportionment of Delegates at the Chicago session recommended that the constitution and by-laws should be amended so as to provide for one delegate from each State Association—for every 750 members, or fraction thereof. This recommendation was adopted, and thereby Minnesota gained one delegate, now having three instead of two. At the annual session of 1925, and every third year thereafter, delegates should be reapportioned.

RETIREMENT OF DR. SIMMONS

Dr. Geo. H. Simmons, having completed more than twenty-five years of honorable and distinguished service as editor and general manager of the Association, it was announced, had, upon his own request, retired from active duties, and was made editor and general manager emeritus.

HYGEIA

Hygeia, the Medical magazine for the laity, published by the Association, reported a loss for the year, of $42,752.14. This loss should impress the members of the Minnesota Medical Society that this most valuable medium for extending medical knowledge to the public, should be *better supported.* We recommend that every member of this society subscribe for Hygeia, as an evidence of approval of extending medical knowledge to the laity.

SECTION ON STOMATOLOGY

The section on Stomatology, which has continuously had a very small attendance, was abolished, and made a part of the Section on Miscellaneous Topics.

RESOLUTION ON PRINCIPLES OF MEDICAL ETHICS

The House of Delegates took an important action on the question of medical ethics, by adding to the principles of Medical Ethics suitable penalties for violation of these principles and resolved:

1st, that these rules of Ethics are hereby declared to be an integral part of the Rules and Regulations, Constitutions and By-laws covering each component county.

2nd, that the penalty prescribed for the violation of these Ethics shall be censure, suspension or expulsion, as the individual governing body shall elect.

PRESIDENT

Dr. Wendell C. Phillips, of New York, was unanimously elected President-elect of the Association. In addition to the above, the time of the House of Delegates was taken up, principally, in conducting the enormous amount of routine business connected with the largest Medical Society in the world. Certain subjects, such as the relation of the physicians to the prohibition act, and the limitations of prescriptions of alcohol; medical education, particularly graduate medical education and short courses for physicians, so that the general practitioner may have opportunities for keeping up to date, were recommended. A great deal of discussion was raised by the subject of periodic examinations, involving not only the recommendation that each state society endorse and further periodic examinations, but also favor a condemnation of the periodic examination by societies controlled by laymen.

Respectfully submitted,
J. L. Rothrock,
T. L. Chapman,
J. C. Litzenberg.

Dr. Litzenberg: If I may be permitted, I should like to make a few short remarks in regard to the Delegates from the State Association. The fact that I have been elected a Delegate is testimony enough that not enough care is exercised in selecting Delegates. I am surprised at the lack of influence of Minnesota in the American Medical Association, and it is because the Delegates are changed so frequently. Election as a Delegate of this Society is not an honor, it is a duty and a service, and it is a big job. A Delegate has no time to attend scientific meetings, and when he goes to represent this Society at the American Medical Association, he must give his whole time to it. No man begrudges that time, but if Minnesota is to have any influence in the American Medical Association, it must have Delegates there long enough at least to have a

bowing acquaintance with the other Delegates, which at the present time they have not.

It is a custom with our Society that a man be elected for one or perhaps two terms besides his original term. By the time he gets acquainted, someone else is elected. Some friend of mine got up in the meeting when it came time to elect a new Delegate, and moved that Dr. Litzenberg be made a Delegate to the A. M. A.—friend if you wish to call him that. Some other enemy of mine got up and moved the polls be closed, and that is the reason you got such an inefficient Delegate. That is not right. The Delegates should be elected by either a nominating committee or by the Board of Councilors, and they should be selected with great care. They should be men who are willing to serve five, ten, fifteen, twenty, twenty-five years if the Society wants them to. The men who have influence in the American Medical Association have been in the House of Delegates for years. I know of several who have been there fifteen and twenty years, and they have been trained as Delegates and therefore have influence. It is a benefit not only to the state society to have a considerable voice in the doings of the American Medical Association, but it is of great service to the American Medical Association to have the states send experienced Delegates.

May I say at this time that I am making these remarks thus forcefully because I do not want to be a Delegate further, but I want the Board of Councilors to select or nominate, at least, perhaps two for each vacancy. No man begrudges the amount of time that he spends or the amount of money that it costs him to go as a Delegate, but if a man is to go for ten, fifteen or twenty years, it becomes a financial burden, and I believe that this Association, along with other state societies, should pay the expenses of the Delegates to the House of Delegates of the A. M. A., or as much of the expenses as the Society may see fit. That is the only way you can get the influence you want in the American Medical Association; you can get it by having a man go there year after year and become acquainted with the work of the Association.

In order that you may be sure that I am not making a bid for being sent down there for fifteen or twenty years, let me say that I do not want to go, but I want to see somebody selected from this state who will go for a long period of time, as long as he serves efficiently and well. If more states would adopt that policy, the American Medical Association would be made up of a higher class of Delegates. They are high now, I have no criticism of the members of the House, they are fine men, as fine as I have ever seen; but I notice that those who have the influence are the ones who keep sending their Delegates year after year and the ones who pay their expenses, or a part of their expenses.

Dr. J. L. Rothrock read the report of the 1926 meeting of the American Medical Association.

REPORT OF THE MEETING OF THE HOUSE OF DELEGATES AT THE SESSION OF THE A. M. A., HELD AT DALLAS, APRIL 19 TO 23, 1926.

The House of Delegates was called to order by the Speaker, F. C. Warnshuis, promptly at 10 a. m., April 19th. The Committee on Credentials reported 114 qualified delegates present.

The first order of business was the customary address of the Speaker, F. C. Warnshuis, in which he made the following recommendations to the House of Delegates. The first concerned unethical practices on the part of certain members of the profession. "While the attitude of the Association towards State Medicine and contract practice is well defined, and the position of the Association is very clearly set forth with regard to these practices, there are evidences in many communities of a tendency toward a rapidly growing development of this type of practice, and investigation shows that in many instances it is aided and abetted and sponsored by medical men, members of constituent units of our Association, who, hiding under the guise of public health education, seek to justify their action and to ignore in so doing the Association's enunciated policies."

To meet this situation the Speaker recommended that the House of Delegates give consideration to formulating some type of disciplinary measures, whereby former enactments will be observed and complied with by members of the Association.

Another recommendation was the proposal of a change in the By-Laws empowering the Board of Trustees, after an investigation into all the facts as to facilities, such as hotel accommodations, suitable buildings for display of exhibits and places for the meetings of the various sections of the Scientific Assembly, to select the place for the annual meetings, as well as the time for the meetings.

The address of President William D. Haggard was devoted to the theme of periodic examinations and contained much constructive advice on this all-absorbing question.

The address of President-elect Wendell C. Phillips, after reviewing the contributions to medical science since the World War, called attention to the productiveness of American investigators, notably the work of Dicks, Dochez and Blake on scarlet fever, the discoveries made on the virtues and relation of light to rickets, the toxin-antitoxin prevention of diphtheria being the most important. Morever the United States may be truly called teachers to the World in organization, and methods of preventive medicine.

Dr. Phillips also stressed the necessity for the education of the public in matters of health and urged that a survey be ordered by the Board of Trustees into ways and means best to promote public health education.

The following resolution was read on the death of Dr. Thomas McDavitt:

Resolved, By the House of Delegates of the American Medical Association, that through the death of Dr. Thomas McDavitt this Association has lost a friend and counselor who, through his untiring and devoted serv-

ice, played an important part in its development and in extending its influence as a scientific society and its benefits as a philanthropic organization. And be it further

Resolved, That while we bow in sorrow that our friend and Fellow has passed on and that we are deprived of his companionship and helpful counsel, we are deeply grateful for the privilege of our long association with him and revere his memory, because of his work for this Association and because of his devotion to the noblest traditions of our profession.

FROM REPORT OF THE BOARD OF TRUSTEES

CONFERENCE ON PERIODIC HEALTH EXAMINATION

Pursuant to the action of the House of Delegates a conference on periodic Health Examination was held in Chicago, November 20-21, 1925. One of the outstanding lessons of this conference points to the need of leaders of this move in each State who will serve as lecturers and demonstrators to county and district medical societies, for the purpose of promoting periodic health examination by practicing physicians, for in this manner a distinct service can be rendered to the public by the profession. The Association has issued a book of instruction and special forms to be filled out covering the scope of such examination, which can be had on application.

HEALTH EDUCATION OF THE PUBLIC

RADIO HEALTH TALKS

The Bureau of Health and Public Instruction has given a monthly program of health talks, through the Chicago station, using exclusively material from Hygeia. Material from Hygeia is also being broadcast from stations located in several other cities, and is done under the auspices of the local medical societies.

NATIONAL PROHIBITION ACT

The report of the Committee appointed by the Board of Trustees pursuant to a resolution adopted by the House of Delegates, 1925, a regulation of the National Prohibition Act places a limitation on the amount of spirituous liquor which may be prescribed for a given patient in a given time. The constitutionality of this regulation has been called into question and a trial suit has been brought to test its legality, which now awaits a decision from the U. S. Supreme Court. This case is still pending.

THE FEDERALIZATION OF STATE HEALTH ACTIVITIES

The Sheppard-Towner Act is still in effect and will continue to be operative until June 30, 1928, when it lapses, unless the time is extended by further legislation. The opposition of the Association to this Act is based on the fact that under it the State surrenders its sovereignty to the Federal government on the payment by the Federal government of a paltry subsidy, for the performing of a function which the State should assume and thereby retain the entire control.

Two other bills of similar character are now pending in Congress to extend the system of Federal subsidies to control State Health and Medical activities. One applies to rural health work and the other to the prevention and control of drug addiction, both similar to the Sheppard-Towner Act, and the Child Labor Act, and are open to all the objections of these last mentioned acts.

REPORT OF JUDICIAL COUNCIL

The solicitation of patients through so-called Health Association or Hospital Associations. Attention has been called to questions of ethics involved in the organization and operation of so-called health associations or hospital associations which solicit members. These members are, of course, prospective patients. The principles of medical ethics of the American Medical Association specifically condemn the solicitation of patients, whether by individual physicians, by groups, by institutions or by organizations of physicians and that therefore insofar as these health or hospital associations are organized for the purpose of soliciting patients they are distinctly unethical.

QUALIFICATIONS OF HOSPITAL STAFF MEMBERS

In recent years pressure has been made by osteopaths, mainly in California, Idaho, and Iowa, to force their admission to staffs of hospitals, and particularly those supported in whole or in part by State or municipal aid. The Council has made the following ruling on this question:

In order to receive and retain among hospitals a position approved for the training of interns a hospital must admit to its staff only reputable physicians, who have secured the degrees of Doctor of Medicine from a Medical College, acceptable to the Council on Medical Education and Hospitals, of the American Medical Association.

REPORT OF THE SECRETARY

There are now 91,792 members in the Association, which makes it the largest organization of its kind in the World. Of these 58,681 are Fellows of the Association. The Secretary calls attention to carelessness on the part of some members who through failure to pay their dues allow their membership to lapse. It costs the Association one dollar per member for reinstatement, which really ought to be assessed against the delinquent member.

The supplementary report of the Board of Trustees with reference to selection of a place of annual meeting, the committee recommended that the Board of Trustees place in nomination not less than three suitable locations, and that from these the House of Delegates make the final choice by vote.

The Committee on Legislation and Public Relations offered the following resolution, which has been adopted:

Whereas, The present court procedure in expert opinion evidence in both civil and criminal cases has in many instances brought public criticism and disgrace on both the legal and the medical professions; and

Whereas, The present procedure in many cases is believed to defeat the administration of justice; and

Whereas, An effort is being made in many states by the bar associations and medical societies of those states to correct such maladministration of justice, and to relieve the legal and medical professions of the public criticism now received; and

Whereas, The American Bar Association is actively pursuing the above laudable effort; therefore, be it

Resolved, By the House of Delegates of the American Medical Association that it recognizes the urgent need for such remedial legislation and such change in court procedure as will correct the abuse of expert opinion evidence; approves the efforts of the various bar and medical associations; and further be it

Resolved, That the House of Delegates endorses the principle that in civic and criminal cases the court may appoint expert medical witnesses, who shall be paid out of public funds, and who may furnish a written report; and that the American Medical Association offers its coöperation by such means as lie in its power to promote such legislation as will be mutually satisfactory to the medical and legal professions toward the correction of the present unsatisfactory procedure of presenting expert opinion evidence, and the Board of Trustees is hereby requested to use the facilities of this organization in such a way as to give effect to the sentiments expressed in this resolution.

And further that the House of Delegates endorses certain principles approved by the Committee on Jurisprudence and Legal Reform of the American Bar Association, and by the American Institute of Criminal Law and Criminology as follows:

That in civil and criminal cases where the issue of insanity is raised, expert medical witnesses may be appointed by the court, and paid from public funds, and that such witnesses may present a written report.

Be it further

Resolved, That a copy of this resolution be sent to the American Bar Association.

Respectfully submitted,
HORACE M. BROWN,
Chairman.

The result of election of officers was as follows:

President, Jabez N. Jackson, Kansas City.

Vice President, John McReynolds, Dallas.

Secretary, Olin West, Chicago.

Treasurer, Austin A. Hayden, Chicago.

Speaker of the House, Frederick C. Warnshuis, Michigan.

Vice Speaker, Dr. Allen H. Bunce, Georgia.

Trustees. Dr. Charles W. Richardson, Washington, D. C.; Dr. Joseph A. Pettit, Oregon; Dr. J. H. J. Upham, Ohio; Dr. Rock Slyster, Wisconsin.

Washington, D. C., was selected as the place of meeting for the 1927 Session.

DR. ROTHROCK: I want to take occasion now to endorse what Dr. Litzenberg says with regard to the necessity of care in the selection of the Delegates to the A. M. A. My attention at the first meeting in which I had the privilege of sitting at the House of Delegates was called to this. I now have had the honor of sitting in the House of Delegates for five different meetings, once as an Alternate, and I have been four times regularly elected. I have done the best I could in representing the Association. The new man, as Dr. Litzenberg pointed out, and as I think I pointed out once before in a report, has little opportunity to do very much. The complexion of the House of Delegates, since I have been there, has changed very little, most of the states sending back from year to year the same men, men who are trained and who have wide knowledge in the affairs of the Association. The new man gets no opportunity to get on an important committee. It seems to me the House of Delegates here would do well to give very careful consideration to the selection of the Delegates in the future and select some man who has the time and the inclination to go. Personally I am not a candidate for re-election. I feel that the House of Delegates has honored me in sending me back the second time, and I would prefer to be left off. I think the point Dr. Litzenberg has made is well taken, that it would be an excellent thing to have these candidates nominated, in which way we might secure more suitable men for the position. Then if we found a man who was interested and could continue to go there and perform his duty, we could continue him in office.

Dr. Braasch took the Chair.

THE CHAIRMAN: If I may suggest it, it has long been the wish of Dr. Herman Johnson, your President, as well as of several of us who have had experience in the House of Delegates, that we might act upon reports of this kind in a more detailed way, and that we might use the methods followed by the House of Delegates of the A. M. A., namely appoint a committee to consider such reports and report back to the House of Delegates at the next meeting, in other words take out the resolutions which are of great value and have them given special consideration by a committee in a way that we cannot very well do in a meeting of this kind without preparation.

Therefore, in moving the acceptance of this report, if you care to, may I suggest that it be followed by a motion that a committee be appointed by the Chair to consider it and report back.

DR. F. J. PLONDKE: I move the acceptance of the report and that a committee of three be appointed to investigate the report and report back later and recommend anything they wish in connection with it.

The motion was seconded and carried unanimously.

THE CHAIRMAN: I will ask Dr. Johnson to appoint a committee a little later.

DR. HARE: In order to legalize all action of the House of Delegates which preceded the adoption of the report of the Credentials Committee, I now move that every action of this House of Delegates which preceded the adoption of that report be now ratified and confirmed.

The motion was seconded and carried unanimously.

THE CHAIRMAN: Next is the report of the Committee on Necrology.

Dr. Olga S. Hansen, Necrologist, read the report.

REPORT OF NECROLOGY COMMITTEE

President, officers and members of the House of Delegates of the Minnesota State Medical Association:

Again the time has come for us to pause a moment in our hurrying lives to call the roll of our fellow practitioners who have answered the summons of the angel of death since last we met in official session.

Members of the Minnesota State Medical Association

Charles Clifford May, Adrian,
State U. of Iowa, College of Medicine, 1886,
Born, 1860; Died March 15th, 1925; Age 65.

Edward Everett Hoit, Detroit,
U. of Michigan, Homeopathic Medical School, 1878, and Rush Medical, 1885,
Born, 1854; Died April 4th, 1925; Age 71.

Wm. N. Theissen, Faribault,
College of Physicians and Surgeons, 1901,
Born, 1876; Died, May 15th, 1925; Age 48.

Frank Ressler Weiser, Windom,
Jefferson Medical College of Philadelphia, 1891,
Councilor of State Medical Association, 1913-1925,
Past President of State Board of Medical Examiners,
Born, 1865; Died, May 22nd, 1925; Age 60.

Rolf Frederick Nonnestad, Lanesboro,
University of Minnesota Medical School, 1921,
Born, 1896; Died, May, 1925, Age 29.

Hugo J. A. Hartig, Minneapolis,
U. of Minnesota Medical School, 1914,
Born, 1890; Died, July 26th, 1925; Age, 35.

Andrew J. Gibson, Duluth,
U. of Edinburgh, Scotland, 1894,
Died at Creetown, Scotland, Aug. 18, 1925.

James A. McLaughlin, Minneapolis,
McGill University Faculty of Medicine, 1894,
Born, 1870; Died, September 16th, 1925; Age, 55.

Florence C. Baier, Minneapolis,
Medical Department Hamline University, 1897,
Born, 1854; Died, October 3rd, 1925; Age, 91.

Thomas Roy Martin, Duluth, Minnesota,
University of Minnesota Medical School, 1907,
Born, 1882; Died, November 15, 1925; Age, 45.

Gilbert T. Haugen, Fergus Falls, Minnesota,
University of Minnesota Medical School, 1905,
Born, 1879; Died, March 30, 1926; Age, 47.

Thomas S. McDavitt, Saint Paul,
Northwestern University Medical School, 1879,
Secretary of State Board of Medical Examiners, 1912-1926,
Secretary of Minnesota State Medical Association, 1900-1918,
Trustee of American Medical Association,
Born, 1857; Died, March 3rd, 1926; Age, 69.

Francis R. Woodard, Minneapolis,
Rush Medical College, 1879,
Born, 1848; Died, March 29th, 1926; Age, 78.

John Crowe, Virginia,
Rush Medical College, 1901,
Born, 1868; Died, April 10th, 1926; Age, 58.

Asher C. Taylor, Duluth,
University of Michigan, 1874,
Born, 1848; Died, April, 1926; Age, 77.

Members of the medical profession: (not members of the Minnesota State Medical Association)

John Dargavel, Minneapolis.
Knut Hoegh, Minneapolis (Honorary member Hennepin County Medical Society).
Edward Walther, Saint Paul.
S. Chapen Jackson, Euclid.
George L. S. Schulze, Minneapolis.
E. F. Conynghame, Underwood.
Daniel W. McDougald, Minneapolis (Member of American Medical Association).

All of our members who have died during the past year have given fully and generously of professional skill and of personal strength to the communities in which they have lived. In considering the ages at which death occurred one is impressed with the very small number who have died in their early years of professional service, and with the long lives of usefulness which almost all have lived.

Volumes could be written of the honesty, the enthusiasm, the stability and the self-sacrifice of each of the deceased members in his own circle of patients who depended on him for personal care and solace, and in the wider sphere of community and state service. But these personal memoirs have been written in the lives of the individuals and the communities which each has served. Two names stand out above the others in the annals of medical education in Minnesota, through their connection with the State Board of Medical Examiners. Dr. Frank Ressler Weiser was formerly president of this board. Dr. Thomas McDavitt served as secretary of this board since 1912 to the time of his death. Dr. McDavitt was also a Trustee of the American Medical Association and through this office exercised a wide influence in raising medical standards and ideals.

Their names lie before you on the roll of honor. The nobility of their lives will influence the world through the generations that are to come.

Respectfully submitted,
Olga S. Hansen,
Chairman Necrology Committee.

The report was adopted by a rising vote.

The Chairman: Next is the report of the Radio Committee.

Dr. E. H. Norris read the report of the Radio Committee.

Second Annual Report of the Radio Committee 1925-1926

This committee has endeavored to carry on the work during this past year which had been initiated in 1924. We have felt that the Radio offered another and a very strategic means for popular medical education and we have been repeatedly gratified by the manifestly growing interest in our program.

Our program began on October 9, 1925, and was continued through until March 1, 1926. One paper

of about 15 minutes in length was read on each Friday evening during these months. The choice of subjects for the papers was in large part left to the individual authors, but so far as I know every paper with exception of the one read by Dr. E. P. Lyon, was read and censored by some member of our committee. This particular paper was not sent in for our review, and believing, as we did, that the Dean's paper, least of all, would need censoring, we made no call for it. The committee offers its apology for its negligence in this regard and we would feel very badly about our carelessness if it had not been that the reading of this paper has so thoroughly awakened the State Medical Association and aroused its members to strengthen their opposition to "State Medicine."

The following is a list of the eighteen papers which comprised our program:

Oct. 9, 1925	Infantile Paralysis....Dr. W. R. Shannon
Oct. 16, 1925	Pregnancy and Childbirth.....Dr. L. W. Barry
Oct. 23, 1925	Some Facts about Insanity.....Dr. W. Hengstler
Oct. 30, 1925	Blood Pressure.....Dr. J. N. Dunn
Nov. 6, 1925	Your Heart.....Dr. H. Richardson
Nov. 13, 1925	The Prevention of Tuberculosis.....Dr. E. K. Geer
Nov. 20, 1925	Tonsils and Adenoids.....Dr. M. Wheeler
Nov. 27, 1925	Ulcer and Cancer of the Stomach.....Dr. D. C. Balfour
Dec. 4, 1925	Diseases of the Glands of Internal Secretion .....Dr. L. S. Rowntree
Dec. 11, 1925	Control of Cancer.....Dr. V. C. Hunt
Dec. 18, 1925	Changing Concepts concerning Focal Infection.....Dr. E. C. Rosenow
Jan. 15, 1926	The Relation of the Family Physician to the Public.....Dr. F. U. Davis
Jan. 22, 1926	Preventing Diphtheria....Dr. H. S. Diehl
Jan. 29, 1926	The Cancer Problem....Dr. W. J. O'Brien
Feb. 5, 1926	The Service of the University Hospital to the People of the State.....Dr. E. P. Lyon
Feb. 12, 1926	The Abuse of Cathartics.....Dr. T. A. Peppard
Feb. 19, 1926	Health Habits in Children.....Dr. Max Seham
Feb. 26, 1926	The State Medical Association and the Public.....Dr. H. M. Johnson

The committee has received many letters and telephone calls from laymen who had "listened in." There have been many requests for copies of the papers read; some have suggested topics which they would like to hear discussed over the Radio; some few have asked for the name and address of the reader of a particular paper and we have had no hesitancy in furnishing it; many have written in to add a word of encouragement to our effort and to tell us that they enjoyed and were interested in our program.

Finally, the committee wishes to urge the continuance of the Radio talks during the oncoming season, and to take this opportunity to thank the officers of WCCO for the fine coöperation they gave us.

Respectfully submitted,
E. H. Norris,
Chairman.

Dr. Carl Drake: In moving the acceptance of this report, I think it would be only fitting that the thanks of the Association be extended not only to the Committee, but to the members of the Association who have written the papers, and to WCCO.

The motion was seconded and unanimously carried.

The Chairman: The next committee to report is the Committee to Foster Better Obstetrics.

The Secretary: Dr. Adair is not here, but he has sent his report.

Dr. W. A. Coventry: I move the report be read.

The motion was seconded and carried, and Dr. Meyerding read the report.

Report of Committee to Foster Better Obstetrics

At a meeting of the House of Delegates at the last annual meeting of the Minnesota State Medical Society a committee of one was appointed to make suggestions tending to foster better obstetrics in the State.

Subsequently it was suggested that the former president appoint someone in each councilor district to work with this committee in studying the needs of his locality. It was not thought wise to carry out this suggestion.

Efforts have been made to secure greater attention for obstetrics on the programs of State and County societies, which have met with some success.

Work in building up the prenatal side of obstetric care has been fostered by the State Board of Health and I have incorporated in this report a statement which was published in the May issue of Minnesota Medicine.

The Medical Profession of Minnesota and the Sheppard-Towner Act

On April 20, 1921, the State Legislature of Minnesota authorized the State Board of Health to provide instruction and advice to expectant mothers, and also accepted the provisions of any Federal Act for promoting the hygiene of maternity and infancy. On November 23, 1921, Congress passed "An Act for the promotion of the welfare and hygiene of maternity and infancy, and for other purposes." January 10, 1922, the State Board of Health created a Division of Child Hygiene, approved the program outlined by its executive officer, and appointed the State Advisory Board on Maternity and Infant Hygiene. The recommendation for the formation of County Administrative Boards was also approved. The Federal funds became available to the State on March 28, 1922. On April 21, 1922, the State Advisory Board, which numbers among its members two practicing physicians, one pediatrician, and one obstetrician, suggested the formation of County Administrative Boards consisting of two physicians, one county commissioner, and two women. On May 10, 1922, the question of the

formation of County Administrative Boards was taken up with the Secretary of the State Medical Association. The next day a letter was sent to the President of the State Medical Society regarding the County Administrative Boards. On June 16, 1922, a letter was also sent to the President of the State Medical Association relative to this matter. On this same date, Dr. E. C. Hartley was appointed Director of the Child Hygiene Division, which was organized on July 1, 1922. In August of that year, Dr. E. C. Hartley published an editorial in MINNESOTA MEDICINE entitled, "The New Child Hygiene Division—Its Relation to the Physicians of Minnesota." In this article the program of the Division was outlined. On September 23, 1922, a letter was sent to each county health officer and to the officers of the State and each District and County Medical Society relative to the plan of work, with the request that a physician be selected in each county to act on the County Administrative Board. On October 12, 1922, a letter was received from the President of the Minnesota State Medical Society recommending two physicians from each county to serve on these Administrative Boards. These recommendations were approved by the State Board of Health at a meeting held on October 25, 1922. On October 14, 1922, at the Annual Meeting of the House of Delegates, a resolution, to indorse the action of the American Medical Association in condemning the Sheppard-Towner Act, was laid on the table, where it still lies. The Minnesota State Medical Association has apparently refused to support the American Medical Association in its action relative to the Sheppard-Towner Act.

The Medical Society of this State has coöperated in carrying out the provisions of this Act since the work was begun in Minnesota. So far as the Maternal Hygiene is concerned, the formula has been very simple, namely, to educate the laity to seek professional advice from physicians wherever and whenever possible during pregnancy, labor, and the puerperium. This, of course, presupposes that the physicians are willing and ready to give this care to their patients. The author has been interested mainly in this phase of the work, and owing to some criticisms and actions has been impelled to write this statement of facts for the enlightenment of the medical men of this State. It is important in matters of this kind to have accurate information before opinions are formed, and decisive action taken. The work is still being carried on according to the original plan of coöperation with the medical profession of this state.

In reference to prenatal work there is also appended the report of a committee of obstetricians appointed by the Children's Bureau, entitled "Standards of Prenatal Care" (Bureau Publication No. 153). This report is very concise and is the result of careful work by a group of representative obstetricians from different parts of the United States. It is submitted with the hope that the State Medical Society may see fit to approve the Standards of Prenatal Care as set forth in this outline.

There is also appended a brief statement, which will soon be published in the *American Journal of Obstetrics and Gynecology,* regarding some work which is being done in New York State by their State Medical Society working in conjunction with the New York State Board of Health.

> "An important activity is being conducted by the New York State Department of Health in coöperation with the Committee on Post Graduate Medical Instruction of the State Medical Society. The sentiment has grown among physicians that the steadily increasing group consciousness and the growing desire of organized medicine to assume leadership in the solution of the great problem of public health fix a very definite responsibility upon the official medical bodies. This particular committee, in its last annual report to the House of Delegates, made in April, 1926, states that the continuous education of the practicing physician is the greatest single contribution that organized medicine can make.
>
> "The manner in which this scheme was developed is of interest. The committee as appointed represented all sections of the State and a survey was made based on answers to a questionnaire sent to the County Societies as the units of the organized profession. The officials of these societies were asked to give information as to what plans they had made or would agree to make for post-graduate teaching and what facilities for the purpose were at hand. A central organization for the collection of this information was developed under the direct supervision of Dr. A. N. Thompson, of the Kings County Medical Society, and an appropriation totalling $5,000 was secured from the Council of the State society. The New York State Department of Health offered its full coöperation and placed the services of its regional consultants in obstetrics and pediatrics at the disposal of the Committee.
>
> "Of particular interest in connection with this important work are the courses of six lectures each in obstetrics and pediatrics which were offered to various County societies and which it is a pleasure to record have been well attended. The appended map is a graphic presentation of the work which has been done. The lectures on obstetrics have included the prenatal care, the management of normal labor, postpartum care, and the pathology of labor and pregnancy, and have been given by various members of the Regional Consultant Staff of the State Department of Health, including Drs. John O. Polak, Frederick W. Rice, Ralph W. Lobenstine, Harold C. Bailey, George W. Kosmak, James K. Quigley, and Arthur C. Martin.

"The activity described above is worthy of emulation by organizations in other states. It presents the subject of better maternity care directly to the attention of the practicing physicians by a method that originates and is carried out within the ranks of the Medical Profession. It provides for coöperation with various lay agencies but the essential aim of the movement is an effort to solve a medical problem under medical auspices."

Similar plans of work are being carried out in Oklahoma and Alabama.

The Committee respectfully recommends the above report and suggestions to the House of Delegates of the Minnesota State Medical Association for its careful consideration and approval.

Respectfully submitted,
F. L. Adair,
Chairman.

A motion was made by Dr. Coventry, and seconded, that the report be accepted and placed on file.

Dr. W. A. Jones: May I ask if this receives the endorsement of the officers of the Association and whether there is included in the report the non-adoption of the Sheppard-Towner act?

The Chairman: This report has not been read, so far as I know, by the officers of the Association. May I suggest that a committee be appointed similar to the other one to review the report and report to the House of Delegates tomorrow?

Dr. Coventry: I will withdraw my motion.

Dr. Jones: I move that a committee be appointed to review this report and report back to the House.

Dr. C. B. Wright: I should like to amend that to the effect that it be referred to the Committee on Public Health Education who are already investigating this matter, and I think it is proper to have this under their examination.

The amendment was seconded and carried, and the original motion as amended was carried.

The Chairman: In regard to the committee to report on the A. M. A. Delegates' report, Dr. Johnson makes the following selection: Drs. W. A. Jones, E. T. Sanderson and Carl Drake.

We will next hear the report of the Committee on Public Health Education, Dr. F. J. Savage.

Dr. Savage read the report.

REPORT OF COMMITTEE ON PUBLIC HEALTH EDUCATION

This committee has done little but outline proposed activities. You are all familiar with this function as outlined in the constitution and as published in Minnesota Medicine.

Dr. Coventry has in charge the question of the maladministration of free clinics throughout the state. The Ramsey County Medical Society has adopted the following resolution and the committee has been appointed and is at work.

"That the President appoint a committee of five to make a study of the manner of admission of patients to the free medical clinics of St. Paul and to then draw up recommendations, for action by our society, that the Ramsey County Medical Society feel should be the governing principles for admission of patients to free clinics."

Hennepin County has found that one of the most satisfactory features in connection with free clinics has been the placing of two medical men on the governing board of the various organizations conducting free clinics. Outside of the Twin Cities and Duluth there are but few free clinics. However, the expressed opinions of our members from outside the cities show that since the admission of free patients to the University Hospital has been taken away from medical men and placed in the hands of County Commissioners the admission of patients in some places has become a matter of politics and is not based on the inability of patients to pay ordinary fees.

Another field of proposed activity of this committee is to aid and encourage each component county medical society to conduct at least one annual public medical meeting. Dr. Geo. Earl is in charge of this section. At the meeting of this committee on May 2nd the following resolution was adopted:

"That through the Association's Secretary the committee get in touch with all organizations possible who are working in the state on public health matters and that the committee immediately begin to arrange a speakers' bureau of men who can talk at various types of public health meetings and that the committee ask the Council for clerical help for the Association Secretary for this work up to the amount of $200.00 per month."

In order to facilitate this part of our program your committee requests each component County and District Medical Society to appoint a committee on public health education which shall function along lines similar to the State Association's committee. To make such meetings successful the general coöperation of Parent-Teacher Associations, civic clubs of all kinds and women's clubs, together with the local press, is essential. We want the public to appreciate the medical profession and what it stands for—the value of periodic medical examinations, what immunization means to the health of the community and many other matters brought home to the various communities throughout the state by the medical profession itself and not by lay organizations. This movement is under way and if we don't assume leadership we will simply be trailers.

Dr. C. B. Wright has charge of working up the part of our program dealing with periodic medical examinations.

Dr. Helmholz has in charge the matter of children's free clinics and the operation of the Sheppard-Towner law. He has been authorized to make a study of the practical workings of the law throughout the state but so recently that we are unable at this time to report on the matter.

Although fraudulent medical advertisements stare us in the face in every issue of our daily papers your committee agreed that we have enough on our hands in other matters of greater importance to make it inadvisible at this time to start on this campaign. *The Minneapolis Journal* is the one exception to the rule. Dr. Burnap has been assigned this part of our pro-

gram and it was agreed that his function shall for the present consist of investigation only.

Your committee would like instructions from this body on the question of allowing the use of Physicians' names in the public press on matters which may come out from time to time in connection with public health matters of the State Association. We recognize the fact that from the newspaper man's standpoint the use of names gives more of an element of news than if names are omitted. Another method might be adopted of having all news items come through the Association's Secretary. Your chairman incurred the wrath of some of this committee by giving to the Associated Press representative the names of this committee and a telephone interview on what we planned to do in the way of public health meetings throughout the state. The entire responsibility of this matter rests with the chairman of this committee and on no other.

RECOMMENDATIONS

1. In view of the greatly increased activities of the office of the State Association's Secretary and in view of the fact that his present clerical force consists of the half term services of a very efficient assistant, this House of Delegates recommend to the Council the employment of additional assistance and authorize the expenditure of an additional sum up to $200.00 per month to cover administration expenses.

2. That this House of Delegates urge—through our Association Secretary—each County and District Society to appoint a local Committee on Public Health Education to function along similar lines of your State Association's committee and to work in conjunction with them.

C. B. Wright,
F. J. Savage,
W. A. Coventry,
H. F. Helmholz,
W. L. Burnap
George Earl

Dr. Savage: I should be very glad to hear whether this publication of names is approved or whether I am in for additional censure.

Dr. W. A. Jones: I hope that Dr. Savage's report will be accepted, but I should like to explain that in the Hennepin County Medical Society we have a committee that deals out newspaper information without mentioning any names. I am hard-boiled enough to believe that we are a cowardly race of doctors when we don't want to see our names in print. I think it does give some prestige to a report, and I don't see why we should be so thin-skinned. I believe in publicity from all angles, and I hope Dr. Savage will be upheld in any publicity that he may choose to introduce.

Dr. C. L. Scofield: I think this should be referred to a special committee, and I move that this report be submitted to a committee of five to report tomorrow or the next day.

The motion was seconded and carried.

The Chairman: The next is the report of the Committee on Public Policy and Legislation.

Dr. Charles Bolsta: Your Committee on Legislation, acting upon the instructions of the President, proceeded to get up a tentative draft of a bill.

Dr. Bolsta read his report and the draft of the bill, with the understanding by the House that the bill should not be incorporated verbatim in the records.

A motion was regularly made, seconded and carried, that discussion of this report be taken up the day following at the meeting of the House of Delegates.

The Chairman: Next is the report of the Committee on Hospitals and Medical Education.

Dr. N. O. Pearce read the report.

REPORT OF COMMITTEE ON HOSPITALS AND MEDICAL EDUCATION

This committee, consisting of seven members, has to do with questions arising concerning the hospitals of the state, particularly acting as an avenue of information and advice for the American Medical Association Hospital Committee. It has also occupied itself with the development and carrying out of plans for making postgraduate and review work readily available for the man in practice. Numerous meetings have been held during the year, and a number of hospitals have been inspected at the request of the national organization, mostly with a view to determining their suitability for registration on the list of hospitals approved for interns. Three hospitals were recommended.

Relative to the postgraduate instruction for men in practice, your committee has met jointly with a committee of the State Medical School which has been developing this work at the University for the past six years. From a very modest beginning, this committee has carefully and conservatively developed a plan of short courses of review work for the man in practice which we believe is as comprehensive and efficient as anything of its kind in the country. These courses vary in length from three days to one week. The time of the student is occupied from 8:00 a. m. to 10:00 p. m. and the schedules are so arranged that a man may obtain a comprehensive review of a single subject in three days, but because of their consecutive arrangement, he may stay on for two weeks or more completing a review of four or five subjects. The program is changed from year to year and the courses cover the most practical subjects in medicine, surgery, gynecology, pediatrics, pathology, bacteriology, therapeutics and all their branches. A new departure this last year has been evening courses held one night each week for thirteen weeks. At present, a course in pathology and one in neuro-anatomy are under way with a registration of about 35 men in the two classes. Naturally such courses are available only to the men who are within easy driving distance of the University and they were not advertised beyond the local counties. If they prove popular, as it would appear from these first courses, this will become a permanent part of the postgraduate program.

The other phase of the postgraduate work, and the one in which the State Society has perhaps taken a leading part, is the program of extension courses so designed that any group of members of this Society

may get together and request a series of lectures, clinics and demonstrations on subjects of their own choice and in their own community. The committee has proceeded with considerable caution in the development of this work as we are extremely anxious to place it before the physicians of Minnesota in the most practical, feasible and efficient manner. Therefore until recently it has not been widely advertised. Last summer a thirteen weeks course was carried out at Fergus Falls and Moorhead with sixty students and twenty-six instructors taking part. Questionnaires to both students and instructors produced a large amount of information and many suggestions, and our experience teaches us that our plan must be very elastic to meet the demands of different communities. For instance, in the program now in operation at Tracy and Marshall the course is shorter, and two instructors are sent one week to Tracy, the next to Marshall—the men from Marshall going to Tracy one week, the men from Tracy going to Marshall the next. In the course just getting under way at Austin and Albert Lea, the length of time is only eight weeks, with a single instructor appearing at Austin one day and at Albert Lea the next. It is the desire of the committee to offer these courses with any number of lectures or instructors desired by the local group. A small concise pamphlet covering the general scheme, with necessary details showing how to obtain one of these courses, was mailed to every member of the society with the state program, so all necessary information is now available to each of you. It is not the desire or plan of the committee to urge these courses on any community. Experience has taught us that the best results will be obtained only when the demand comes spontaneously from the local group.

In all of this postgraduate work, the committee has worked intimately with the committee from the medical school, and the medical school and the faculty are wholehearted and absolutely behind this postgraduate and extension work. They take pride in it. They feel that the contact is of great value to the school as well as to the practitioners, and the facilities and resources of the school are placed at our disposal without reservation.

In closing a word must be said of the fine coöperation of the General Extension Division of the University. It is through the facilities of this department that this postgraduate work is made possible without expense to the State Society. Your committee recommends the continuation of the present postgraduate programs for physicians as a jointly coöperative plan of the University Medical School and the State Medical Association.

Respectfully submitted,
N. O. Pearce,
W. A. O'Brien
Hilding Berglund,
E. M. Hammes.

Dr. Workman: I move the adoption of the report.

The motion was seconded and carried unanimously.

The Chairman: The Committee to review the report of the Committee on Public Health Education will consist of Drs. Scofield, Chairman, Hayes, Henderson, Peter Boysen, Plondke.

Next is the report of the Committee on the Constitution.

Dr. Savage: Do you want that read?

The Chairman: I think a copy of this proposed Constitution has been sent to every member. Since that report I understand a number of changes have been made by the Council. Do you wish to have the report as amended read?

Dr. L. Sogge: I move that the changes be read to the House of Delegates.

The motion was seconded.

Dr. Coventry: I would offer an amendment that the changed Constitution be printed in Minnesota Medicine, and as the attorney has already given an opinion that it cannot be acted upon for one year, we will have plenty of time to digest it in the meantime, and that will facilitate matters a good deal. I refer to the Constitution, not the By-laws.

Dr. Savage: The By-laws may be amended now, that is they may be read now and amended tomorrow. The Constitution must be read at this time or we cannot act upon it next year, according to the Constitution under which we are now working.

The Chairman: It seems to me, to expedite matters, Dr. Coventry, it would be well to read it to comply with the legal requirements.

Dr. Plondke: The whole Constitution does not have to be read, as I understand it. It applies only to the amendments.

Dr. Savage: According to the Constitution under which we are now operating, the By-laws may be amended, if they are proposed at one session of the House of Delegates, at the next session. However, the Constitution itself must come before this body, then be sent to each component society, and also must be published in Minnesota Medicine.

The Chairman: The amendment was not seconded. Your motion, Dr. Sogge, therefore stands that only the changes to the Constitution be read.

The motion was carried.

Dr. Savage read the proposed amendments to the Constitution.

The Chairman: Gentlemen, the adoption of the Constitution is certainly a very important piece of business. A great amount of work, needless to say, has been put upon this, not alone by Dr. Savage and those members of the Committee who have helped him, but it has been read very carefully by the entire Council. Nevertheless, it seemed to us in considering the matter before it was finally adopted we should again place this before a committee of the House of Delegates for their consideration and report on the Constitution tomorrow. We would very much appreciate, therefore, if there are any additions or criticisms to the Constitution, that they be made to the members of this committee that Dr. Johnson has already suggested, providing you decide to have the committee appointed.

Dr. G. S. Wattam: I move that the report be referred to a committee appointed by Dr. Johnson for consideration and report tomorrow.

The motion was seconded and carried.

THE CHAIRMAN: Dr. Johnson has suggested the following committee: Dr. Savage, Chairman, Dr. Baxter, Dr. Adams, Dr. Parker, Dr. Stewart.

Attention has been called to the fact that the By-laws must be presented today in order to be adopted.

DR. SAVAGE: I think these amendments have to be proposed and then lie over a year before they can be acted upon. I should like to state that this Constitution is a composite thing. It represents the opinions of men of various parts of the state and has been twice revised by the Council. It seems to me that the men who have given this a good deal of thought have it in shape, and that it might very readily be attended to now unless they have some changes that amount to something. They have checked it with their own copies; if there are any such changes, well and good; but if there are none I don't see why we shouldn't just let it go for action another year.

THE CHAIRMAN: I think the point is well taken. We will consider the matter further tomorrow. It seems to me this committee should review those as well. There is no objection to taking them separately now.

THE SECRETARY: This refers to the amendments to the By-laws: "These By-laws may be amended at any annual session by a majority vote of all delegates present at that session after the amendments have lain on the table for one day."

DR. SAVAGE: I think it is necessary to go through the changes in the By-laws if this body wishes to adopt them tomorrow. If they wish to adopt the whole thing next year, then this unpleasant duty may be deferred one year.

THE CHAIRMAN: Is there any advantage to be gained by adopting them tomorrow?

DR. SAVAGE: It legalizes some of the committees. This Committee on Public Health Education has no status whatever. I think they should be read today so they can be adopted tomorrow. I think the By-laws should be adopted as amended tomorrow, and it is necessary to read them today, I believe.

A motion was regularly made, seconded and carried, that the changes in the By-laws be read. Dr. Savage read the amendments.

DR. COVENTRY: I move that these changes be entered on the record as amendments to the By-laws and that the report be referred to the last committee appointed to consider the Constitution, for report tomorrow.

The motion was seconded and carried.

THE CHAIRMAN: We are through with the reports of committees and will proceed to the matter of new business.

DR. W. A. JONES: The subject I am about to introduce has already been introduced by Dr. Norris of the Radio Committee with reference to the speech by the Dean. The Hennepin County Medical Society decided that something ought to be drafted for the benefit of the House of Delegates. This may be a presumption on our part, but it was so ordered and so done. At a meeting on the third of May, at which there were 275 men present, including our visitors and speakers and those interested in the work, the following resolution was introduced:

"Whereas, A radio speech, a copy of which is herein incorporated," (I hope it will not be printed again) "was broadcast on February 5, 1926, by the Dean of the Medical School of the University of Minnesota through Station WCCO, therefore be it

"Resolved, That the Minnesota State Medical Association is opposed to the policies broadcast in the above-mentioned radio speech; be it further

"Resolved, That the Minnesota Medical Association is opposed to the general policy of admitting patients who can pay to the University Hospital or other public institutions which are supported by taxation. This resolution is not intended to exclude emergency cases or cases certified by the County Commissioner; be it further

"Resolved, That the members of the Minnesota State Medical Association do hereby express their willingness to coöperate with the Board of Regents of the State University of Minnesota and others in authority to the end that an abundance of suitable clinical material secured entirely from the ranks of the worthy poor may be available for medical instruction, and pledge their support in securing public and private funds for this purpose; be it further

"Resolved, That the Hennepin County delegation therefore recommend to the House of Delegates of the State Association that a committee of seven be appointed by the President, Dr. H. M. Johnson, who shall be an active member of this Committee, to inquire into the policies and administration of the medical school and the Minnesota General Hospitals and affiliated hospitals, namely the Todd Memorial, Christian Cancer, the proposed Eustis hospitals, through conference to be held with the committee, the President of the University, the representatives of the Board of Regents of the University of Minnesota, to consider what the future policy of the University shall be concerning the problems under discussion; be it further

"Resolved, That a copy of these resolutions shall be spread upon the minutes of this Association and copies sent to the President of the University of Minnesota and to the President of the Board of Regents."

I move the adoption of this resolution.

DR. CARL DRAKE: This resolution, to my knowledge, was not voted on by the Ramsey County Society, but I think I speak for the Ramsey County Society and for the delegates, unofficially, of course, when I second this motion. The question involved is really one of policy at the University, and I think the appointment of this committee should solve it better than any other method that I know of.

DR. COVENTRY: I should like to offer an amendment that this resolution be referred to a committee of five, three members of that committee to be outside of Ramsey and Hennepin Counties, and that they report back tomorrow on the resolution.

The amendment was seconded.

THE CHAIRMAN: Dr. Johnson has this matter very much at heart, and I regret to say illness prevents his

being here tonight. Dr. Coventry, would you care to modify your number to seven? In that event the same committee could act in both instances.

Dr. Coventry: That is all right, but I prefer to have the majority of that committee from outside Hennepin and Ramsey Counties.

The Chairman: That will be taken care of.

Dr. Schulze: How is it possible for this committee to report when they are supposed to take conference with the authorities at the University?

The Chairman: As I understand, this committee will consider the resolution from all of its aspects. This resolution, as I interpret it, is not so much an object of censure as it is a method to bring about very desirable reformation in the Medical School.

Dr. Corbett: The purpose of these resolutions was not destructive criticism, but rather constructive criticism, giving an opportunity for the committee of seven to be appointed from this body to investigate the matter thoroughly, to meet with all parties concerned, to confer with the Regents, and to iron out the difficulties. A committee of that kind, according to this resolution, will have the power to do these things, and they will have to have time to investigate and think, get together and do everything in the best possible manner for all concerned. It is hoped that after this committee has performed its function, many of the differences of opinion that exist between the University authorities and the medical profession will be found not to exist at all. Therefore, it would seem as though this committee should spend a period of time on this matter, and that we should take action so far as the appointment of the committee is concerned, for that is purely a matter of form. That is the sum and substance of the resolution.

Dr. C. B. Wright: I feel that something constructive may come out of this thing, at least we all hope so. If it does, I feel sure that every member of this Association wants to back up the University and make a good school of it. I rather feel it would be a mistake to adopt these resolutions and then appoint a committee to investigate. I don't know how you feel, but I believe it would be better to accept the resolution and then appoint the committee and have them make the inquiry first before we adopt the resolution. When you adopt the resolution you already commit those men to a certain policy, which I think it would be better not to do. In other words, if they are going to inquire into this thing, let them inquire first and then bring in some resolutions. If we get a good committee to investigate the whole situation and report back, that is the action we really want. I feel it would be better to accept the resolutions, place them on file, appoint our committee, and then when the state association gets ready to make resolutions, it can make them.

Dr. Coventry: Speaking in defense of my amendment, those resolutions as presented, according to my notion, need very careful scrutiny. They involve this society in an angle that will be very embarrassing to us. Everything else that has been brought up in the House today has been referred to a committee to report tomorrow. I dare say there has not been a thing presented today of more importance than that resolution as far as the policy of this society is concerned, and, therefore, I speak in favor of the amendment that I offered that it be referred to a committee to report tomorrow.

Dr. Savage: I second Dr. Coventry's amendment. When I first saw this resolution it seemed like a very valuable thing, but on careful study it takes on the nature of an absolute condemnation. It may be wrong; it may be right. I don't know. I think the men from Hennepin County are in far better position to judge whether it is right or not. I think the resolution with the condemning clause stricken would put us in far better light and get us further with the Board of Regents and with the investigation of this matter. I agree that if the committee would first investigate and then bring in a complaint perhaps it would be better.

Dr. Corbett: This resolution has been very carefully gone over again and again and again. It is general. The very fact that it mentions the Todd Hospital, the Cancer Hospital and others is an admission that it is not absolute. Further, it gives the Regents of the University a knowledge of how we feel about it. We have a right to our opinion, and I think we should furnish a copy of this resolution to the Regents as our stand. We owe it to them to let them know how we feel about it. We should have this thing defined. What limits should there be with a pay patient at the University Hospital? Should there be no limit at all so they might all be pay patients? Should it be possible for any body of men actually to encourage the pay patient to the University Hospital to such an extent that the worthy poor might be included? These things have to be thought of. Such a thing is a possible thing, not an idle dream, and in general we are opposed to pay patients, not in all instances, but that is left very elastic for this committee to work on. I think it is the sentiment in general that the pay patients should never be allowed to come in to any tax supported institution to such an extent that it is a material or considerable factor. In gifts that are made to the University they may have to fulfill a condition, but I feel that the pay patient should be discouraged, and that we should go on record as discouraging any great increase in the number of pay patients at the University Hospital or any other hospital that is tax supported. I feel it is not to the best interests of either the institution or the doctor.

Dr. Coventry's amendment was carried, and the motion as amended was carried.

The Chairman: The Committee will consist of Dr. Johnson as Chairman, as stated in the resolution, Dr. C. C. Kennedy, Dr. George Head, Dr. George Earl, Dr. Arthur Collins, Dr. E. S. Judd, and Dr. W. L. Burnap. They will meet and report tomorrow to the House of Delegates.

Dr. Rosenberry: I have a memorandum from the Winona County Medical Society with respect to this same matter.

Dr. Rosenberry read the resolution.

Winona, Minn., May 15, 1926.

The Minnesota State Medical Association:

The Winona County Medical Society, called in extra session to discuss an excerpt from remarks made by Dr. E. P. Lyon of Minneapolis, at the Annual Medical Congress on Education, Medical Licensure, Public Health and Hospital, March 10, 1925, and published in the Journal of American Medical Association April 10, 1925, and an alleged speech by Dr. E. P. Lyon, Dean of the Medical Department of the University of Minnesota, given over WCCO February 5, 1926.

After thorough discussion of these two matters, the Winona Medical Society does go emphatically on record as opposed to socialization of the practice of medicine; that his alleged speech, broadcasted throughout the country, was, to say the least, in very bad taste; that his severe and unwarranted attack on every hospital and practicing physician that does not belong to the teaching faculty of the University of Minnesota, is a breach of professional ethics, which if any other hospital or staff were guilty of would probably meet the severe condemnation and contempt of the profession.

Be it therefore resolved, That his action in these matters be referred to the House of Delegates of the Minnesota Medical Association and the Medical Faculty of the University; that this Society requests the House of Delegates to call the attention of the University Regents and Faculty to these matters. This Society feels that Dr. Lyon is not a suitable man to occupy the position of Dean of the Medical Faculty.

The delegate of this Society is instructed to bring this matter to the attention of the House of Delegates of the Minnesota State Medical Association.

Dr. Wattam: I move that it be referred to the same committee.

The motion was seconded and carried.

Dr. Carl Drake: The matter of dues has been brought up. Is this the proper time to talk about it? According to this Constitution it cannot be brought up until a year from now. The Association has a good deal of work that it has planned to do, and it needs some funds. I think the feeling in regard to the necessity for increasing the dues was rather unanimous. I move that the dues, beginning 1927, be increased to $15. According to the Constitution as I read it, this change requires a four-fifths vote of the delegates to go into effect next year.

The Chairman: It was read last year and will have to be passed upon now before your motion is in order. I will ask the Secretary to read the amendment as read last year.

The Secretary: Last year at the House of Delegates' meeting an amendment to the Constitution was presented and should have been voted upon as old business, but it slipped by. The amendment as presented by Dr. Braasch last year was to Article II of the Constitution, "Funds and Expenses," and read as follows:

"Funds shall be raised by an equal per capita assessment on each component society. The amount of the assessment shall be fixed by the House of Delegates, but shall not exceed the sum of eight or ten dollars per capita per annum, except on a four-fifths vote of the delegates present."

Dr. Plondke: I have the legal opinion of Mr. Oppenheimer in which he states it is impossible to increase the dues under the old Constitution, and for that reason, if there is no second to the other motion, I move that there be an assessment of $15 levied on each member of the Society.

The Chairman: What is the opinion from the counsel?

Dr. Plondke: "The practical solution of the problem would therefore appear to me, if your Association so desires, to have the House of Delegates adopt the foregoing amendment by two-thirds vote and then have the House of Delegates by a four-fifths vote levy an assessment of the amount deemed necessary."

The Chairman: Does he state this amendment cannot be made at this meeting?

Dr. Plondke: He says you cannot increase the dues. You can levy an assessment. I should have said levy an assessment of $10.

Dr. Coventry: According to the Constitution you can offer an amendment to the Constitution but it must be voted on at the following annual meeting. That resolution was offered last year to raise the dues to $10. At this meeting we can vote upon that resolution, which is an amendment to the Constitution. That will make the dues $10, and then you can have a motion for an assessment of $5 and get it up to $15.

The Chairman: The Chair rules that Dr. Coventry's point is well taken. Therefore, a motion to adopt this amendment as read is in order.

A motion was regularly made and seconded that the amendment be adopted.

Dr. Plondke: The counsel says, "It is our opinion that you cannot legally adopt an amendment to the Constitution unless such amendment in substance at least shall have been presented in open meeting." His opinion is to levy an assessment.

The Chairman: It was presented in open meeting last year. We did it just for the purpose of voting on it as we propose to do today.

Dr. Plondke: Was it for the amount that we want to raise it today?

The Chairman: What we propose to do is to change the dues according to Dr. Drake's motion to $15. That can be done under this resolution by a four-fifths vote.

Dr. Drake: We are not trying to change the Constitution. The Constitution says that the dues shall not be over $5 except on a four-fifths vote of the delegates present. It doesn't make any difference whether it is two, three, four, five or fifteen; there is the exception that the assessment can be made on a four-fifths vote.

The Chairman: Do you mean that this amendment, then, is unnecessary?

Dr Drake: According to our Constitution we can make that assessment anything we want any year. This is on Page 5: "Funds shall be raised by an equal per capita assessment on each component society. The amount of the assessment shall be fixed by the House

of Delegates, but shall not exceed the sum of $5 per capita per annum except on a four-fifths vote of the delegates present." If we have a four-fifths vote we can make it a thousand dollars if we want to—but I don't want to.

DR PLONDKE: You said dues; I am talking about an assessment. The paragraph you read said assessment.

THE CHAIRMAN: The question before the House is the adoption of this amendment: "Funds shall be raised by an equal per capita assessment on each component society. The amount of the assessment shall be fixed by the House of Delegates, but shall not exceed the sum of $10 per capita per annum, except on a four-fifths vote of the Delegates present."

DR. HARE: It seems to me that we might facilitate matters very much by laying this amendment on the table and then assessing each member $15. If we adopt this amendment, then we must of necessity levy an assessment in addition, because this makes the dues $10, rather $8 or $10. It does not set the amount of the dues, but says they shall not exceed $10. However, if we levy an assessment of $15, we have done the whole thing in one movement. That being the case, I move that the amendment lay on the table. The assessment is the dues.

DR. COVENTRY: You have an opinion from your lawyer. If we pay annual dues we pay annual assessments.

DR. PLONDKE: It is simply a difference in the word.

DR. COVENTRY: Were my dues $5 or $10? I thought I paid $5 dues and $5 assessments. According to that wording I paid $10 assessment.

Dr. Hare's motion to table was seconded.

DR. DRAKE: Does it say anywhere in the Constitution that we pay dues?

THE SECRETARY: "Funds and Expenses. Funds shall be raised by an equal per capita assessment on each component society. The amount of such assessment shall be fixed by the House of Delegates, but shall not exceed the sum of $5 per capita per annum except on a four-fifths vote of the Delegates present." It does not say dues; it says assessments all the way through.

THE CHAIRMAN: We can clarify the situation by following the suggestion of Dr. Hare.

Dr. Hare's motion was carried.

DR. HARE: I now wish to make a motion that the assessment for the coming year be levied at $15 per capita.

The motion was seconded by Dr. Drake.

DR. OPPEGAARD: I wonder how many have been secretary of their component society. I happen to have been secretary in an outlying district where we have a large territory to cover, about eight counties, with this year fifty-three members. I have had to spend half the time answering the question of what the special assessment was for. Dues is one thing; assessment is something else. There is no difficulty as far as the dues go, but if you have an assessment it requires an explanation.

THE CHAIRMAN: You apparently are in a district where Dr. Herman Johnson and his cohorts have not yet gone. What you need is a medical economics meeting.

DR. OPPEGAARD: I was instructed to vote for $10. I think we will find that we will have several drop out.

DR. HARE: May I suggest that the assessment be levied as an assessment and collected as dues.

DR. STEWART: In the old By-laws, Section 13, Chapter 10, Page 26, it says, "The Secretary of each component society shall forward his assessment." Assessment means dues.

The motion made by Dr. Hare was carried, forty-eight in favor and nine opposed.

DR. MALONEY: I should like to submit the following resolution:

"Be It Resolved, That it is the sense of this meeting that the State Medical Association maintain a full-time man to represent them during the coming session of the legislature."

We all know why the assessment was made. This resolution is to give the Council our opinion on how some of the money is to be spent. We know what was done with part of the last assessment, and this is just to sanction the spending of some more in the same way.

I move the adoption of this resolution.

The motion was seconded and carried.

DR F. S. WARREN: Rice County voted in favor of this raise in the assessment, but they instructed me to ask that a budget of intended expense be sent to the county.

DR. HAMILTON: I should like to present a resolution on behalf of the delegate from the Hennepin County Medical Society on expert testimony in court. In view of what Dr. Rothrock said about the proceedings of the A. M. A., it is not necessary to say much as an introduction. The special reason for introducing a resolution of this sort at this time is that the legal profession is very much interested at the present time in reforming court procedure.

RESOLUTION

Whereas, There is at the present time widespread and serious criticism of the laws and practices governing the use of expert witnesses and the introduction of expert testimony before courts and juries; and

Whereas, The subject is one of particular and vital interest to the members of all of the professions; and

Whereas, It appears that a satisfactory solution of the problems involved requires the preparation of legislation to supplement the present laws governing the subject in the State of Minnesota;

Now therefore be it resolved:

First: That an invitation should be extended to representatives of all the professions urging their coöperation in the preparation of legislation designed to eliminate the present unsatisfactory practices connected with the introduction of expert testimony, and to provide a new method which will accomplish the purpose which expert testimony is intended to accomplish.

Second: That in such work the representatives of the various professions should consider, among others, the following questions:

(a) Is it true that the present system is wrong in that it permits litigants to call experts on questions involved in the trial of cases and that after such witnesses have examined the subject of litigation they oftentimes testify to wholly opposite conclusions as a result of such examinations?

(b) Should power be granted to the court to appoint disinterested experts to examine the subject matter of any litigation and to testify in a non-partisan capacity, subject to cross examination by either of the litigants?

(c) Should fees for such services, so rendered upon appointment by the court, be paid by the state?

(d) Should the number of experts to be used in any case be determined by the court upon the importance of and the amount involved in the litigation?

(e) Should such appointment be made by the court on its own motion or upon application by one or the other or both of the litigants within a reasonable time before the calling of such cause for trial?

(f) Should all experts be barred from testifying in particular cases except those who were appointed by the court or those chosen by the litigants, who had prior to the trial actually been present and conferred with the experts appointed by the court at a time fixed by the court?

"We move that the President of the Minnesota State Medical Association be requested to appoint a commission of five medical men who in conjunction with groups from other professions are to study problems concerning expert testimony. The commission should further have for its purpose the reform of the present unsatisfactory and unfair method of introducing expert evidence."

I may say that the legal profession certainly will be represented by such a commission, and it seems to me the medical profession is sufficiently interested in it to be so represented also.

Dr. Coventry: I move the resolution be adopted.

The motion was seconded.

Dr. Plondke: Possibly I did not understand this resolution correctly, but if I did it covers all expert testimony. Does that mean also in malpractice suits in selecting your witnesses? Suppose, for example, I were sued for malpractice. Wouldn't I select my own expert witnesses?

Dr. Hamilton: We have a document in this country known as the Constitution, which is a very great disturbing factor when it comes to the question of reviving expert procedure in court in testimony. The attorneys say that every man has a right to choose his own witnesses and to cross-examine the witnesses presented by the other side. I should think it would be impossible for any one to be deprived of the right of introducing witnesses. The idea is that there probably will be some action taken revising the introduction of expert testimony, not medical testimony, but expert testimony from any professional standpoint. Of course, our commission so appointed would merely serve in respect to medical expert testimony. I suppose the commissions together probably would have something to offer in the legislature. There are certain things, so the lawyers say, that as long as the Constitution stands cannot be abrogated, and the right to select your witnesses is one of them.

Dr. Plondke: I happen to be in a position where I select witnesses, and if we had to rely on the judge to appoint the witnesses, according to Dr. Rothrock's report, it would be rather embarrassing for us.

Dr. C. B. Wright: As I understand it, this is simply a committee to investigate. Don't they have to report to the House of Delegates before they take any action in the matter?

The Chairman: I understand the resolution calls for the appointment of a commission by the President to investigate and report later.

Dr. Jones: It will take them about two years to report.

The motion was carried.

Dr. W. A. Jones: This is a resolution from the Minneapolis Health Department. I want to refer it to the proper committee or have it accepted.

RESOLUTION

Whereas, Public health and preventive medicine has developed in the past fifty years as a coödinated outgrowth of the medical profession, and

Whereas, The medical profession is in full accord and in sympathy with the present administration of public health and preventive medicine, and

Whereas, Proper administration of public health and preventive medicine is dependent upon the coördination and coöperation of the medical profession, and

Whereas, The trend in public health education today is toward the education of laymen, not physicians, and the preparing of such laymen, not physicians, to hold positions of public health administrators in states, counties, and cities, and

Whereas, We believe that a policy leading to the establishment of public health administration by public health officials, not physicians, is a policy not to the best interests of the public, and

Whereas, The medical profession has always stood shoulder to shoulder in public health and preventive medicine activities in the community,

Now, therefore, be it resolved, That the Minnesota State Medical Association looks upon the trend in public health education which tends to eliminate the physician from administrative functions as a policy detrimental to the best interests of the community,

Therefore, be it further resolved, That we condemn the practice of public health education, of conferring degrees and preparing for public health administrative office for states, counties, and cities, persons not properly qualified to deal in the important functions of preventive medicine or to coöperate satisfactorily with physicians in general practice in the community because of the lack of knowledge necessary and which is acquired only by persons with the degree of doctor of medicine, and

Be it further resolved, That it is the sense of this Association that state, county and local health officers

should have obtained the education leading to and the award of the degree Doctor of Medicine before and in addition to any other degree that may be held by the applicant, whether in science or in public health.

THE CHAIRMAN: I suggest it might be referred to the Committee on Public Policy and Legislation to report back tomorrow.

DR. JONES: All right.

THE CHAIRMAN: The resolution which Dr. Jones brings forward is one which I think probably will require a little study, and the suggestion has been made that we refer it to the Committee on Public Policy and Legislation, who will report back tomorrow, if that meets with your approval.

DR. JONES: I so move.

The motion was seconded and carried.

DR. WORKMAN: At the meeting of the Council on October 12th, this resolution was adopted:

"It is moved, seconded and carried that the following plan of redistricting suggested by Dr. Workman be adopted subject to ratification of the House of Delegates. It was moved, seconded and carried that the President appoint a new Councilor of the new Ninth District, subject to the ratification of the House of Delegates."

Dr. Workman read the plan of redistricting.

DR. WORKMAN: This new districting was made so it would be much easier for Councilors to cover their districts. Under the old plan it was almost impossible for some of the Councilors to visit their different counties.

I move the adoption of this report.

The motion was seconded and carried unanimously.

THE CHAIRMAN: A letter has been received from Dr. Woodward, Executive Secretary of the Bureau of Legal Medicine and Legislation, to Dr. Meyerding, which will be referred to the Legislative Committee for report tomorrow.

If there is nothing further, this session is ready to adjourn.

THE SECRETARY: I suggest we meet tomorrow at twelve o'clock in the banquet room. We can meet until two o'clock and have luncheon served.

The session adjourned at six-fifty-five o'clock.

SECOND MEETING OF THE HOUSE OF DELEGATES, MASONIC TEMPLE, MAY 18, 1926, AT 12:00 O'CLOCK.

Dr. A. N. Collins of Duluth, Second Vice President, presiding.

Credentials Committee reported as follows:

Of a total number of sixty Delegates, fifty-three were present.

Dr. F. J. Savage, Chairman of the Constitution and By-Laws Committee, reported as follows:

The Committee that was appointed to make suggestions about the proposed revisions makes three suggestions. On page five a little change in the wording from "Funds shall be raised by an equal per capita assessment on each component society" to "Funds shall be raised by an equal per capita assessment of members."

Then there is another change. I have been unable to see all the members of the Committee, but those I have seen have expressed their desire to see one other clause here modified. It reads now as follows, on the same page: "The amount of the assessment shall be fixed by the House of Delegates, but shall not exceed the sum of fifteen dollars ($15.00) per capita per annum except on four-fifths vote of the delegates present." The suggestion is made that the term "two-thirds" instead of "four-fifths" be used.

The third matter, as the Committee suggested last night, was to transpose the election of delegates to the A. M. A. from being one of the functions of the House of Delegates to be made a function of the Council. It would read as follows, and be inserted on Page 13, Section 11: "It shall elect representatives to the House of Delegates of the American Medical Association in accordance with the Constitution and By-Laws of that body." The Committee last night voted to add this clause: "The Association shall pay the expenses of the delegates in attending the Annual Meeting of the A. M. A."

These changes were taken up at the Council meeting, and the expressed opinion of the Council was that payment of the expenses to be incorporated in the Constitution at this time, would be inadvisable.

Those are all the changes that were made.

DR. JONES: Would it be out of order to suggest that this matter be referred back to the Committee until they consult with the A. M. A. Constitution and By-Laws and adopt them, so as to be as uniform as possible? It would put us in a much better position.

DR. SAVAGE: As I understand it, the A. M. A. prescribes the term of office of the various representatives for the different states and this Association is governed by this. But this refers to the manner of election of those officers only. As far as the time is concerned, the term of office, I understand, is settled by the Constitution of the A. M. A.

DR. JONES: We should conform it as near as possible to the A. M. A.

DR. MEYERDING: The American Medical Association print a little pamphlet, and we have all consulted that before making the By-Laws. We originally started out that way.

DR. COLLINS: Do these explanations satisfy you in the matter?

DR. JONES: Yes.

DR. SAVAGE: On page 26 of the By-Laws, Section 13, it reads: "The Secretary of each component society shall forward its assessment together with its roster of officers and members, list of delegates, and list of non-affiliated physicians of the country, to the Secretary of this Association each year before December 31st."

If the words "The Secretary of each component society shall forward the assessment of its members" instead of "The Secretary of each component society shall forward its assessment" be used then this will conform with the other clause. Is that agreeable?

Question—If we adopt these clauses does it take with it the payment of the delegates' expenses to the A. M. A. or not?

Dr. Savage: I tried to make it clear that this Committee recommends that their expenses be paid, but the Council disapproves of it. It is open for discussion.

Motion made that the changes be considered one at a time; seconded.

Dr. Savage: The first change will then read: "Funds shall be raised by an equal per capita assessment of members."

The second change in Article X will read: "The amount of the assessment shall be fixed by the House of Delegates, but shall not exceed the sum of Fifteen Dollars ($15.00) per capita per annum except on a two-thirds vote of the delegates present."

Seconded by Dr. Schulze; carried.

Dr. Savage: The next matter was the transposition of the Article on the election of representatives to the A. M. A., taking it away from the House of Delegates and putting it in the hands of the Council.

In the discussion of that in the Council this morning, (taken away from one of the functions of the House—Page 10 on bottom) the Council felt that it might be better to change this and make it read "that the Council should nominate delegates to the A. M. A., subject to the ratification of the House"; some such words as that. Then the other matter as to whether or not the expenses should be paid; these are open for discussion.

Dr. W. A. Coventry: I move that the Articles be revised to read "that the delegates to the A. M. A. shall be nominated by the Council and voted upon by the House of Delegates."

Seconded by Dr. Baxter.

Dr. Stewart: The Committee you appointed yesterday have in mind that you should have delegates to the A. M. A. attend year after year, and it seemed to the Committee that this would be more sure to be carried out by leaving it to the Council, than by leaving it to the House of Delegates.

Dr. Coventry: I spoke for the Councilors; I do not think that they ought to be invested with too much power. I think we should leave it to the House of Delegates.

Dr. Rothrock: The form presented by the American Medical Association as a Model Constitution for the State Association, which is now being adopted by the State Associations, contains a clause which I will read: "Chapter IV—Election of Officers—The House of Delegates on the first day of the Annual Session shall elect a committee on nominations consisting of ———— delegates, one from each councilor district. The committee on nominations shall report the result of its deliberations to the House of Delegates in the form of a ticket containing the names of members for the various offices."

A clause, furthermore, is provided that additional nominations shall be made from the floor, by members of the House of Delegates.

It can simplify matters and help a great deal, and it seems to me you can get very satisfactory candidates by having somebody make up a ticket.

Dr Johnson: That works all right, but this isn't such a big society, and I think instead of trying to make this an autocratic organization we should make it democratic. No man can become President of this Association unless he is worthy of it.

I think there is one tendency in the A. M. A. that the Board of Trustees is trying to accumulate too much power on its side and then the House of Delegates has to fight.

I admire our Council very much, but we don't always agree, although they have been there a long time. Why not be prepared? I would suggest that things be done in the House of Delegates, especially concerning election of officers.

That is my personal opinion.

Dr. Savage: Dr. Rothrock made the suggestion some time ago, when the Constitution was considered by the Council, that I read this clause from the Model Constitution. The Council did not approve of it when it was taken up.

I stated that Dr. Rothrock had made the suggestion, and they asked if he were in the house and you had already left, Dr. Rothrock, so that this matter has been presented both to the Council and to the House of Delegates, and the opinion seems to conform with what Dr. Johnson says, so that that unit would not be advisable to incorporate in the Constitution.

Dr. Wright: Moved "that in addition to the nominations made by the Council that nominations may be made by the House of Delegates." Seconded; carried.

Dr. Collins: Do you wish to adopt the By-Laws as a whole?

Dr. Drake: There is so much talk about this Constitution and the By-Laws that I haven't it very clear in mind just what these minor changes are. If there is no reason to the contrary, why wouldn't it be all right to hold them over for another year, and vote on them together next year? Unless there is some reason I would make that motion that the By-Laws be submitted, along with the Constitution, for action next year.

Seconded by Dr. Jones.

Dr. Savage: The first thing is to get in operation the various committees. This Committee on Public Policy has no legal standing. We just exist. Unless these By-Laws are wanted, we have some authority for being in existence.

One little matter in regard to the Editing and Publishing Committee is that if these By-Laws are not adopted it probably won't make any difference, but the determination of the salaries by the Editing and Publishing Committee at the present time is up to the Editing and Publishing Committee. Any deficit is up to the Council.

With this adopted, the salaries of those connected with the Editing and Publishing is up to that Committee, subject to the approval of the Council.

Those are just the differences between not adopting the By-Laws now or adopting them.

Dr. Meyerding: The By-Laws now give us authority to do it. It would be a great convenience if we had something definite to go by.

Dr. Drake: That being the case I am only too willing to withdraw my motion.

Dr. Jones also withdrew his second.

Dr. Schuldt moved that the By-Laws as amended be adopted as a whole. Seconded; carried unanimously.

The following officers were duly nominated and elected:

President, Dr. William F. Braasch, Rochester
First Vice President, Dr. H. B. Aitkens, LeSueur Center
Second Vice President, Dr. S. H. Boyer, Duluth
Third Vice President, Dr. F. E. Gray, Marshall
Secretary, Dr. E. A. Meyerding, Saint Paul
Treasurer, Dr. Earle R. Hare, Minneapolis.
Councilors:
First District, Dr. Melvin S. Henderson, Rochester. It was voted that the appointment of Dr. L. Sogge, Windom, as Councilor for the Second District, and Dr. W. A. Coventry, Duluth, as Councilor for the Ninth District, be confirmed.
A. M. A. Delegate, Dr. J. L. Rothrock, Saint Paul
Alternate, Dr. W. A. Coventry, Duluth
A. M. A. Delegate, Dr. W. L. Burnap, Fergus Falls
Alternate, Dr. O. J. Hagen, Moorhead
Alternate to Dr. J. C. Litzenberg to succeed Dr. Burnap, Dr. R. T. La Vake, Minneapolis.

Dr. Collins: We are now ready to hear a report of the Council by Dr. Workman.

Dr. Workman: Second meeting of the Council held in the Blue Room, Masonic Temple, at 9 a. m., May 18th.

Members present: Drs. Workman, Coventry, Sogge, Condit, Braasch, Wattam, Savage, Meyerding.

The Council recommends to the House of Delegates that the following be made honorary members of the State Association: G. E. Putney, M.D., Paynesville, Graduate of Harvard, 1876; J. H. James, M.D., Mankato, Graduate of University of New York City, 1875.

Dr. Meyerding brought up the matter of the Chisago-Pine County Medical Society complaining of the action of Dr. Fink of Minneapolis. It was the opinion of the Council that this matter should be referred to Hennepin County Medical Society for investigation and report.

Motion made by Dr. Condit, seconded and carried that the Public Health Education Committee be allowed $200 per month to carry on their work. This appropriation is to go into effect June 1, 1926.

The matter of paying the expenses of the delegates to the American Medical Association was taken up and after discussion a motion was made, seconded and carried that this matter be laid on the table at the present time, because of insufficient funds.

It was suggested that the State Secretary write to other State Secretaries and investigate the matter of paying delegates' expenses to the A. M. A.

A letter was read from Dr. O'Brien in regard to an exhibit at the State Fair the coming year, and a motion was made, seconded and carried that this be laid on the table.

Dr. Sogge suggested that before the end of the year the State Secretary send to all members a letter explaining what the State Association has done, and what it intends to accomplish, so that all members may be more familiar with the work of the Association.

Dr. Savage brought up the matter of the Constitution, and same was discussed.

Meeting adjourned.

Dr. Collins: The Council recommends to the House that the following be made honorary members of this Association:

G. E. Putney, M.D., Paynesville, Graduate of Harvard, 1876.

J. H. James, M.D., Mankato, Graduate of University of New York City, 1875.

In adopting this report this will automatically take care of this.

Moved and seconded that the Report of the Council be accepted.

Dr. Lida Osborn: I would like to say for the Blue Earth County Medical Society that Dr. James was made a life member of our County Society. I know he would object to be an honorary member, because he has no active part in the proceedings, and I should suggest, until he requests to be made an honorary member, that this be withdrawn. Dr. James desires to continue as an active member.

Dr. Collins: Do you wish his name stricken from the list?

Dr. Osborn: I will find out from our Society. Of course, nothing was said of it. He has always taken an active part and he thought he would have no active part if he was an honorary member. Of course, if he requests it, it would be different. I wish you would not act on that just yet.

Dr. Collins: Taking into consideration the matter about Dr. James, do you wish to vote on the report?

Motion was made to adopt the report and leave the matter of Dr. James out for the present time and refer it to the Council. Seconded; carried.

Dr. Collins: The next is the Public Health Committee Report; Dr. C. L. Scofield Chairman.

Dr. Scofield: I must confess that that Committee did not function. I was unable to get a copy of that report, and was also unable to act on it. Chairman, we would be glad to listen to Dr. Fishbein.

Dr. Fishbein: Yesterday I heard the original report of the Committee as presented by Dr. Wright, and that dealt particularly with the question of the "Relation of Medicine and the Public Press" and perhaps some of you were present last evening and heard Mr. Galt speak on this subject.

In Chicago we have had a very close relationship with the Press. That relationship has worked out to the great advantage of Medicine.

Not long ago the Board of Trustees of the American Medical Association was asked to consider certain violences of certain subjects whereby great stress was placed on the view of the statements of a man who read a paper having a great deal to say on unorganized hospitals and other similar subjects. And the Board of Trustees made the particular request that in the matter of issuing publicity relating to Medicine and

similar subjects, not to permit such false impressions to occur.

We have fixed our publicity so as to secure complete coöperation with the Press. This is actually a matter of close organization; it means that you must be in readiness to supply the newspapers with information on medical defense, when such information is called for; it means that you must have a complete understanding of newspaper methods.

Because of legal complications, newspapers often find it impossible to publish indefinite stories, without some definite person or organization on which to pin those stories. If a story is printed with a definite relationship to an organization or individual in the medical profession, the story is recognized by the legal authorities as a story with foundation and truth.

For that reason we are not very conservative in our relation with the Press in using the name of a physician who has accomplished something worthy of merit. If a man is big enough to receive the recognition of the whole medical profession, the medical profession as such should not be so small as to resent that due credit be given to him before the public, as well as before the profession. It is that attitude that we adopt in issuing our work.

It would appear to me to be a rather small thing to resent their names being published in the press for their merit. Of course, I know there are many men who value the publicity and who take advantage of every possible thing to get their names in the press. I know I can name you all the publicity hounds in Chicago and perhaps some in St. Paul. That being the case it would seem to me best to have within the Medical Society a Committee, called the Publicity Committee.

If this Committee will be ready at all times to consider and pass on medical subjects and be ready to serve the press in that manner, you will have the best coöperation with the Press.

Our experience has gone so far as when a medical news item comes into the Press office they call this Committee and ask if it is all right, or if it is not all right. They will not print it unless we say it is all right. And that same thing happens in the midwest headquarters of the Associated Press.

In other cities where they have these Committees they get equally good results. The Public Relations Committee has just exactly that conception in mind, and it seems to me that they should have every encouragement to do that in order to do away with all fallacies and other errors.

Dr. Wright: Is it in order to discuss this subject?

Dr. Collins: Yes.

Dr. Wright: Being a member of that Committee, at the last meeting when this was discussed, I felt that there was no necessity for the names of that Committee to be used publicly, and personally I prefer not to use it. My experience with the doctor has been that he doesn't object to publicity for himself, but he seriously objects to publicity for anybody else.

I think we all like to see our names in the paper, but in this organization where the Secretary has such good judgment, I would like to see him known to every newspaper and every man throughout this state who has anything to do with publicity, so that any publicity coming from that Committee can come out under the name of Dr. E. A. Meyerding. I would like to see him be the go-between between our organization and the Public Press.

Dr. Collins: Inasmuch as there was no report on this matter, we have nothing to adopt.

I wish to thank Dr. Fishbein for giving us the advantage of his experience.

Dr. Collins: Will the Legislative Committee please report at this time?

A Member: Dr. Bolsta is not here, but he wanted me to suggest that this bill be referred to the Committee on Public Health Education.

Dr. T. J. Maloney: I am on that Committee, and there was some discussion yesterday of some censoring of colleges giving degrees of Doctors of Health, which was referred to the Legislative Committee.

I spoke to Dr. Bolsta and he thought that this matter should be referred to the Committee on Public Health for their consideration, and be referred back to the Legislative Committee.

I think this Basic Practice Bill should be laid on the table of the Legislative Committee for further consideration.

Dr. Meyerding: Insofar as the Legislative Committee is concerned regarding the matter Dr. Maloney spoke about, it simply means that they desire that all the Public Health Officers shall be M.D.'s. A lot of schools are giving degrees of Doctors of Public Health to others that are not doctors.

Then there was also a Narcotic Bill.

I would like to suggest that they be referred to one of the standing committees and that they would have power to act.

Dr. Maloney: I move that the suggestion of the Secretary be accepted; that it be left in the Legislative Committee. Seconded; carried.

Chairman: The matter is brought up as to whether the House of Delegates wish to meet in the fall to consider this Medical Practice act, or whether they wish to refer it to the Legislative Committee.

Dr. Johnson: Regarding whether the House of Delegates should meet next fall or whether to delegate that power to a Committee concerning that Medical Practice Act, it would be necessary to decide now. There may be other problems which may come up which may make it necessary to call a meeting just the same. But it is up to you. You would have to be prepared to meet a whole day, or possibly more.

But if you want to delegate that power to the Council you could do that. You could select a Committee amongst yourselves, or nominate a Committee to represent the House of Delegates, and they with the Council would have the right to O. K. that Medical Practice Act.

Dr. Wright: May I ask that if we have the meeting in the fall, can we finish this Constitution?

DR. MEYERDING: No. The Constitution must be adopted at an Annual Meeting.

DR. PLONDKE: I move that there be a committee of seven appointed, with Dr. Johnson as Chairman of that Committee, to act on this particular question and to meet with the Council next fall.

Seconded by Dr. Judd.

DR. MALONEY: What shall be done with the Legislative Committee then? My idea was to act on this particular bill and work in conjunction with the Legislative Committee. You can appoint the members of your Committee from this Committee if you see fit. There are five members on the Legislative Committee.

DR. PLONDKE: If I may I would like to withdraw my other motion and move that this matter be referred to the Legislative Committee with instructions to act in conjunction with the Council, with power to act. Seconded; carried.

DR. SAVAGE: I would like to present one matter which I do because it is one of Dr. Johnson's hobbies. This matter came up in the Council meeting and it was agreed that it should be a local matter rather than a matter for action by the Council, and I have formed the following resolution:

"Resolved by the House of Delegates that, if the component Medical Socicties see fit, it is proper for them to publish and post in public places, as they see fit, the names of their members and to include in these notices the fact that they are members of the Minnesota State Medical Association.

"Be it further resolved that, in lieu of membership cards certifying to membership in the Minnesota State Medical Association, being issued by the Association's Secretary, these certificates shall be 8 by 10 inches in size and shall state some of the principles for which this Association stands."

Seconded by Dr. Clay; carried.

CHAIRMAN: The time and place of next meeting has not yet been decided.

DR. HANEY: If the Association wishes, the St. Louis County would be glad to entertain the Association at Duluth any time it may desire to come there.

DR. CORBETT: I move that the invitation given by Dr. Haney to the State Association to meet in Duluth be accepted.

Seconded by Dr. Hamilton; carried.

DR. F. S. WARREN (Faribault): I would like to say a few words in regard to that "Contract Practice Act" which is being brought up before the doctors and the society in regard to putting doctors in Insurance Companies, carrying insurance on their employees.

About ten days ago we had a meeting in Rice County and at that meeting there were two representatives of Insurance Companies in the Twin Cities, and they put their proposition up before us. They intended to appoint their own physicians in different localities who would take care of employees of different corporations, and any doctors outside of these would receive no attention from Insurance Companies.

When going home, I am going to ask every man at our next meeting to bring this subject up and try to interest this society in holding out against any such proposition.

We gave these Insurance people to understand fully that we charge our own prices, as well as they charge for their insurance. They should not interfere with what we charge. Furthermore, we gave them to understand that the public were not slaves to any Insurance Company and that they had the right to select their own physician.

We have informed the Insurance Companies that we intend to treat them properly; that they should pay our fees; that the cases we get would be treated the same as in our practice and that the people would have the right to go to their own physician.

CHAIRMAN: This is very interesting information.

DR. CORBETT: This is a very difficult problem. While it is true that any corporation has a right to select their own physician, we cannot deny that right, and it would seem that the only remedy is the incorporation of a "Fee Bill" in our Medical Society. That is the only possible suggestion that I can think of, that we have a fixed minimum Fee Bill and that be made a part of membership in every medical society. Something must be done in this connection, because the prices are beyond all reason.

DR. COLLINS: Would you like to nominate a Committee and report to this body next year?

DR. WARREN (Faribault): I vote that a Committee be appointed to take this proposition up before the local societies, and to act upon it. I also want to see that they have legislation.

Not long ago there was in operation this same method in one of the Pullman Companies. They had their shops, their stores, their doctors and dentists, their houses—and if the employees did not use these propositions put before them—rent these houses, etc., they lost their jobs. This was taken up before the law and they did not think it was right. It was slavery.

It was moved and seconded that this Committee be appointed. Carried.

DR. SCHULZE: We have voted on the place of the next meeting, but we haven't decided the time.

DR. COVENTRY: I move that the meeting be held in the Spring, 1927.

Seconded by Dr. Savage. Carried.

DR. STEWART (Owatonna): Some, if not all, county societies have been circularized in regard to giving toxin-antitoxin practically free. I understand in one county they are giving it for something like eighty cents a person. It seems to me that that is something we should not do, and our society in Steele County had a meeting and we have refused to do any of that work except for our regular fee. I do not think any free treatment of this kind should be given.

DR. COVENTRY: I would like to offer a motion that the Minnesota State Medical Association thank the Ramsey County Medical Society for their splendid entertainment for the Minnesota State Medical Association at this time.

Seconded; carried.

Dr. Plondke: It is the sense of the House of Delegates that each component society appoint a Committee to act as a Publication Committee, and that all medical subjects go to the public through this Committee through the Public Press, and, of course, that the names of this Committee be withheld—that is, the individual names.

If anything comes up, for instance if the local paper would call me up and ask me what I know about a certain subject, and if I could say that "Dr. So-and-So is a member of that Committee and you can get this information from him," it seems to me that that would be a very good way of solving this problem.

I would suggest that the Secretaries of the County Societies would be a good place to refer it to.

Dr. Savage: Might I make a suggestion to your motion that instead of calling that "Publication Committee," to designate it "Publicity Committee"?

One of the recommendations in this report of the Committee of Public Health Education, which now lies on the table with nothing done about it, incorporates the recommendation that the component societies organize committees which shall work in conjunction with this State Committee and along similar lines.

I think it would be a very good thing to have your motion incorporate the principles as laid down in our report.

Dr. Plondke: I move that the sense of this House of Delegates is that each component society appoint a Publicity Committee; that this Committee be for the purpose of supplying the Public Press with news, and so far as possible that the news to the Public Press be given only through this Committee, and that the individual names of this Committee be withheld.

Dr. Jones: We have no trouble at all with our publicity in Hennepin County. The principal newspapers in Minneapolis always inquire whether it is reliable or whether it is not. In that way we have no trouble with it at all. There is the Chairman of the Publicity Committee, and he has two associate members with him.

Dr. Drake: I second Dr. Plondke's motion.

Dr. Savage: I would like to add an amendment to that motion, that is "that they function in conjunction with the State Association Committee on Public Health Education."

Seconded by Dr. Plondke. Carried.

Dr. Scofield: I would like to suggest that we use the name "Public Health Educational Committee" instead of "Publicity Committee," because I believe that these are really educational matters.

Dr. Plondke: We are misrepresented so many times by what we find in the Public Press and what we want is the Truth. A Publicity Committee covers Public Health and it is primarily a Publicity Committee. (Carried.)

Dr. Johnson: The Committee to which you entrusted the power to draw up a resolution which should be presented for either adoption or modification in the House of Delegates in regard to the University Medical School and pay patients, etc., and the medical profession has drawn up a resolution. I now have this resolution as drawn and recommended by this Committee:

"Be it resolved, That the Minnesota State Medical Association disapproves of the general policy of admitting pay patients to the University Hospital.

"Be it further resolved, That a committee of seven including the President of the Association, Dr. H. M. Johnson, who shall be an active member of this committee, be appointed by the President of the Association, and after having fully informed themselves concerning the problems affecting the medical school, arrange a conference between this committee of the Association, the President of the University of Minnesota and representatives of the Board of Regents of the University to consider what the future policy of the University shall be concerning these problems and other problems which may present themselves concerning the medical school and the medical profession.

"Be it further resolved, That the Minnesota State Medical Association reasserts its stand previously taken against the socialization of medicine and state medicine.

"Be it further resolved, That the members of the Minnesota State Medical Association do hereby express their willingness to coöperate with the Board of Regents of the State University of Minnesota and others in authority to the end that an abundance of suitable clinical material, secured entirely from the ranks of the worthy poor, may be available for medical instruction, and pledge their support in securing public and private funds for this purpose;

"Be it further resolved, That a copy of these resolutions be spread upon the minutes of this Association, and copies sent to the President of the University of Minnesota, and to the President of the Board of Regents."

The above resolution is recommended to the House of Delegates by the undersigned committee.

H. M. Johnson,
George Douglas Head,
E. S. Judd,
George Earl,
Claude C. Kennedy,
Arthur N. Collins,
W. L. Burnap."

Motion was made to use the word "adopt" instead of "accept," which would give more power.

Seconded by Dr. Coventry; carried.

Dr. Johnson: I want to thank the House of Delegates for the interest that they have taken in all problems that have been taken up. There is so much business coming before the House of Delegates that I think some method should be found so that in order to proceed properly we should have certain reference committees.

I also think that we should have certain committees on resolutions that are coming out. Then all resolutions, with the exception of emergency resolutions, could be presented to these committees sometime before the House meets.

I also want to thank the Vice Presidents. I can assure you that the service I have received is greatly

appreciated. I would like to say this for the future. Remember, it is necessary that we have good Vice Presidents.

I certainly appreciate what everyone has done, and I want to thank you all.

Dr. Wright: In conformity with the suggestions made by Dr. Johnson, I think it more wise that the president appoint a Committee of five to study committees of this organization, for instance a Resolutions Committee.

Motion seconded by Dr. Coventry. Carried.

Meeting adjourned.

MONDAY EVENING, MAY 17, 1926

MEDICAL ECONOMICS MEETING

The meeting on Medical Economies was held in the Auditorium of the Masonic Temple, St. Paul, on Monday evening, May 17, 1926, and was called to order at 8:00 o'clock by the Secretary, Dr. E. A. Meyerding, St. Paul.

Mr. Herbert R. Galt, St. Paul, Managing Editor of the Dispatch and Pioneer Press, spoke on the subject "The Medical Profession and the Press."

Dr. Chas. P. Emerson, Dean of the Indiana University School of Medicine, delivered an address on "Degenerative Diseases and Periodic Health Examinations."

Mrs. J. T. Christison, St. Paul, President of the Women's Auxiliary of the Minnesota State Medical Association, spoke on the subject, "The Women's Auxiliary."

Dr. Morris Fishbein, Editor of the American Medical Association Journal, Chicago, delivered an address entitled "Fads and Quacks."

"Problems of the State Medical Association" were discussed by H. M. Johnson, Dawson, President of the State Association, and C. B. Wright, Minneapolis. Due to illness, Dr. W. F. Braasch, Rochester, was unable to appear on the program, and Dr. W. A. O'Brien, University of Minnesota, Minneapolis, made a brief report for the Committee on Hospitals and Medical Education and discussed the University Extension Course.

The meeting adjourned 10:30 p. m.

TUESDAY MORNING, MAY 18, 1926

JOINT SESSION, MEDICAL AND SURGICAL

Called to order by Dr. C. B. Wright, Chairman, at 8:45 a. m., in the Auditorium of the Masonic Temple, St. Paul.

1. Modern Methods of Testing the Acuity of Hearing; Demonstration of Several Types of Audiometers—Horace Newhart, M.D., Minneapolis.
2. Cancer of the Larynx—Gordon B. New, M.D., Rochester.
3. Acute Laryngeal Obstruction—Stuart W. Adler, M.D., Winona.
4. Pathology of Pancreatitis—B. F. Davis, M.D., Duluth.
5. Symposium on Infantile Paralysis:
   a. Its Mechanical Treatment — C. C. Chatterton, M.D., St. Paul.
   b. Its Surgical Treatment—M. S. Henderson, M.D., Rochester.
   c. Correlation of Pathologic and Clinical Pictures—J. C. McKinley, M.D., Minneapolis.
   d. The Treatment of Acute Poliomyelitis with a Poliomyelitis Antistreptococcus Serum—E. C. Rosenow, M.D., Rochester; A. C. Nickel, M.D., Rochester.

INTERMISSION

Clinical and Pathological Demonstrations.

6. Chorea Gravidarum—Neurological Aspect—Frank Whitmore, M.D., St. Paul.
7. Recent Progress of Psychiatry—G. N. Ruhberg, M.D., St. Paul.

   On account of illness in the family, Dr. Orton, Iowa City, Iowa, did not appear on the program.
8. Amnesia, a Clinical Study—E. M. Hammes, M.D., St. Paul.
9. Ureteral Strictures—Edward Bratrud, M.D., Warren.

Meeting adjourned 12:30 p. m.

TUESDAY AFTERNOON, MAY 18, 1926

JOINT SESSION, MEDICAL AND SURGICAL

Called to order by Dr. Theodor Bratrud, Chairman, at 1:45 p. m., in the Auditorium of the Masonic Temple, St. Paul.

1. Moving Pictures of Human Intestinal Protozoa—T. B. Magath, M.D., Rochester.
2. Pericarditis—M. McC. Fischer, M.D., Duluth.
3. Symposium on Cardiovascular Renal Disease, with presentation of cases—Hilding Berglund, M.D., Professor of Medicine, University of Minnesota, Minneapolis; L. G. Rowntree, M.D., Rochester.

   Discussion with relation to Arterial Hypertension—C. P. Emerson, M.D., Dean of Indiana University Medical College, Indianapolis.

   Relation to Surgery—V. C. Hunt, M.D., Rochester.
4. A Consideration of Certain Features of Angina Pectoris—F. M. Smith, M.D., Prof. Theo. and Prac. Med., University of Iowa, Iowa City, Iowa.

INTERMISSION

Clinical and Pathological Demonstrations.

5. Surgical Treatment of Periduodenitis—E. P. Quain, M.D., Bismarck, N. D.
6. Diagonal End to Side Anastomosis—A. N. Collins, M.D., Duluth.
7. Treatment of Some Injuries and Infections of the Hand—M. O. Oppegaard, M.D., Crookston.
8. Hydrocephalus—Surgical Treatment—E. W. Johnson, M.D., Bemidji.
9. Twelve Cases of Trichinosis—F. S. Richardson, M.D., Belgrade.

Adjourned at 5:30 o'clock.

TUESDAY EVENING, MAY 18, 1926

THE ANNUAL BANQUET

The annual banquet was held at the St. Paul Hotel, St. Paul, at 6:30 p. m. At the close of the dinner, the following program was carried out with J. T. Christison as toastmaster:

"Our Guests"—President C. C. Chatterton, M.D., St. Paul.

Due to illness, Mayor Arthur Nelson, St. Paul, was unable to be present and Dr. J. T. Christison extended a welcome.

"Land o' Lakes"—Honorable Clifford Lloyd Hilton, St. Paul, Attorney General of Minnesota.
"Energy of Light"—Chas. H. Mayo, M.D., Rochester.
"The State Association"—W. L. Burnap, M.D., Past President, Fergus Falls; H. M. Johnson, M.D., President, Dawson; W. F. Braasch, M.D., President-elect, Rochester.
"Greetings from North Dakota"—E. P. Quain, M.D., Bismarck, N. D.
"Our Profession"—Chas. P. Emerson, M.D., Indianapolis.

WEDNESDAY MORNING, MAY 19, 1926

JOINT MEETING—MEDICAL AND SURGICAL SECTION

Meeting was called to order by Dr. Theodor Bratrud, Chairman, at 8:45 a. m., in the Auditorum of the Masonic Temple, St. Paul.

1. Relation of Sub-Peritoneal Fat to Abdominal Hernia —C. A. Roeder, M.D., Asst. Prof. Surgery, University of Nebraska, Omaha, Nebraska.
2. Clinic on Diseases of the Thorax—W. S. Lemon, M.D., Rochester; and S. W. Harrington, M.D., Rochester.
3. Treatment of Empyema in the Home—H. J. Lloyd, M.D., Mankato.
4. Post Partum Repair of Obstetrical Injuries—W. A. Coventry, M.D., Duluth.

Installation of officers.

INTERMISSION

Clinical and Pathological Demonstration.

5. Treatment of Athletic Injuries—C. W. Spears, M.D., Minneapolis.
6. Branchial Cysts and Fistulæ: with a report of five cases—J. A. Johnson, M.D., Minneapolis.
7. Ectopic Gestation; Definition, Classification, Consideration—R. J. Hodapp, M.D., Willmar.
8. Cleft Palate—J. J. Gelz, M.D., St. Cloud.

Meeting adjourned 12:30 o'clock.

WEDNESDAY AFTERNOON, MAY 19, 1926

JOINT MEETING—MEDICAL AND SURGICAL SECTIONS

Meeting was called to order by Dr. C. B. Wright, Chairman, at 1:30 p. m., in the Auditorium of the Masonic Temple, St. Paul.

1. *X*-Ray Observations in Pneumonia—L. G. Rigler, M.D., Minneapolis.
2. Symposium on Obstetrics:
   a. Maternal Morbidity and the General Practitioner —H. B. Aitkins, M.D., LeSueur.
   b. Sacral Anesthesia in Obstetrics—O. J. Seifert, M.D., New Ulm.
   c. Rural Obstetrics and a Comparative Study of Its Relation to Puerperal Mortality Statistics—W. A. Piper, M.D., Mountain Lake.

   Discussion—Roy Swanson, M.D., Minneapolis; and C. O. Maland, M.D., Minneapolis.
3. Arteriovenous Aneurysm—J. deJ. Pemberton, M.D., Rochester.

INTERMISSION

Clinical and Pathological Demonstrations.

4. Clinic on Gastric Diseases—Arnold Schwyzer, M.D., St. Paul.

   Discussion—F. J. Plondke, M.D., St. Paul.
5. Surgery of the Infant Abdomen—A. A. Zierold, M.D., Minneapolis.
6. Urologic Diagnosis in General Surgery—A. E. Sohmer, M.D., Mankato.
7. Some Abnormal Findings in Diabetes—Donald McCarthy, M.D., Minneapolis.
8. Blindness Associated with Carbon Monoxid Poisoning—W. R. Murray, M.D., Minneapolis.
9. Physiotherapy in Hospital and Group Practice—Wallace H. Cole, St. Paul.

Meeting adjourned 5:20 o'clock.

THE STATE ASSOCIATION

Banquet Address by Dr. H. M. Johnson, President

Mr. Toastmaster, Distinguished Guests and Fellows of the State Medical Association:

Many changes have occurred in the practice of medicine within recent years due to the many scientific discoveries, which have brought us to realize that in the future one of our duties must be to prevent diseases as well as cure them. The public is taking as much interest in an organized way in the prevention of disease as in its cure. This has brought many new problems, economic, scientific, and legislative, which our profession must solve. The State Medical Association must improve its organization or methods of doing business so as to meet and adjust itself to all these new problems.

This was brought forcibly to my attention while studying the situation and visiting the component societies. I have noted especially the demands upon the profession by lay organizations and individuals for free service where the recipients could well afford to pay for it.

ACTIVITY OF STATE OFFICERS

I have a few suggestions to make—not so much in regard to new machinery—but with a view to speeding up the old machinery and increasing its efficiency. The only new machinery that has been created in the Association is the Committee on Public Health Education. This has been definitely planned to present scientific medicine properly to the public and to co-ordinate health activities within the State of Minnesota, for the best interest of the public and of the medical profession. These suggestions are offered to you for what you think they are worth, and I believe they would have value if followed out.

The President is, and should always be, the active head of the Association. In coöperation with the Vice President, President-elect, and Secretary, he should divide the Association into districts in such a way that every local society would be visited by at least one of these officers every year. He should have with him the councilor of the district and members of active com-

mittees who have some new activity or suggestion they wish to take up with the profession, or who desire to report what their committees are accomplishing. Each component society would be visited at least every third year by the President. I believe these meetings should be special meetings, and the time and arrangements should be made by the state and local secretary.

COUNCILORS

The councilors, according to our constitution, are the governing body of our Association, except when the House of Delegates is in session. They handle our finances and they do it well; besides, they are the court of last resort when it comes to a question of professional ethics. They are given great power by you and it is only proper that we hold them responsible. There is no more important body in our State Medical Association than the council, and if they are active and work well we can be assured of a live Association. Minnesota is particularly fortunate in having councilors who are deeply interested in the welfare of the State Medical Association. Every one of them, as far as I know, has attended or taken part in one or more of these economic meetings; some have even arranged several meetings in their districts. They have aided us in every way to put across the program of new activities, which they have passed on and recommended. The Councilor is the one in his district who is in touch with all the phases of the problems which affect the profession and can be of great service to his local societies, attending their meetings, bringing important matters before them and offering suggestions and advice, which I am sure will be of great value to the societies. I believe they should be a sort of general director of all the societies in their district.

SECRETARY

A very important man in the organization is a good live secretary, without whom no organization can prosper. You are fortunate in having just that kind of a man in Dr. Meyerding. While he is not a full time secretary, nor is he paid as one, he acts as one, and does the work of one, but this cannot go on indefinitely. He must have more help, either a field man or some kind of an assistant. He should have whatever he needs along this line. The activities in the Association have increased a great deal with the consequent increase in the work of that office.

LOCAL SECRETARY AND SOCIETIES

Whether or not local societies are active in the rural district appears to depend much on the Secretary. The careful selection of a man for Secretary who will unselfishly devote much time in getting up programs, and securing a good attendance will be valuable to the society as time goes on and the work increases. I believe the Society should plan on paying the Secretary a sufficient amount to cover such clerical and other expenses as may be incurred.

It is the local Secretary that has the contact and can get members interested in it and the State Association. The local society is the unit on which both the State and the American Medical Association must depend to stand back of all their activities, and these organizations can be no more active or progressive in the long run than the better average of the local societies.

My observations from visiting most of the local societies in Minnesota are such that I can only speak in the highest terms of the efforts made by secretaries in arranging good scientific programs, economic meetings and banquets to promote sociability. I think the latter is very important in every society.

I want to mention what I have seen tried out in a few local societies and what worked well—the papers were given and discussed by local men, but doctors from outside, who were well versed in the subjects, did the final summing up.

The members of the component societies have shown great interest in the activities proposed by the State Association, and many doctors in these societies spoke more strongly for them than even we were able to do. We can all be proud of the fact that at no meeting which we attended was there ever a vote against the new program or the raising of dues, and every one without exception wanted the society to be on a practical business basis.

For some years past the American Medical Association has held annually a meeting of state secretaries to discuss the economic problems of the medical profession. It seems that the time is ripe for the secretaries of our component societies to hold a similar meeting, at which the state officers and members of the various standing committees should be present and take part, so that these secretaries can be fully informed and the various problems can be discussed. It may in time be deemed advisable that the actual expense of such a meeting be paid by the State Association, as is done by the A. M. A.

There is no one who is better situated than the secretary to make contact with the members. No one can represent the State Association before the local societies better than the secretary. The secretary of the component society is a connecting link between the state society and its direct representative in the local society; he is also to a great extent the business manager and general promoter of the interests of the local society.

HOUSE OF DELEGATES

It appears to me that the time is at hand when the House of Delegates must meet a day earlier or in a special session. There are matters so vital to the profession that are constantly arising and that require the consideration by a representative group from every society that we foresee the time when a special session of the House of Delegates will be called.

Our House of Delegates may well adopt the methods of the House of Delegates of the American Medical Association. I refer especially to the procedure that provides for the consideration of all matters of importance by the committees under whose jurisdiction they should come. I suggest that in the future members having resolutions to be brought up should send them to the state secretary or to the chairmen of the respective committees some weeks previous to the meeting of the House of Delegates, so that careful consideration could be given to these subjects before the meeting of the Delegates. It might be well for our secretary to analyze the methods of procedure of the House of Delegates of the American Medical Associa-

tion and to send a statement of this in abstract to the members of our own House of Delegates, in order that we may follow this procedure efficiently in our future meetings.

Then there is the need for sending carefully selected men from each society to the House of Delegates. Be sure that your delegates attend the meetings so that they can report to the societies. These delegates should not be changed too often, if they prove to be the right type of men. A delegate who has regularly attended his County Medical Society meetings should be fully conversant with the opinion and the wishes of that Society in matters affecting policies of the State organization, and it is his duty, when representing his society in the State organization, to present, not his own opinion, but the opinion of the constituency he represents.

AMERICAN MEDICAL ASSOCIATION

Just a few words about the A. M. A. and its officers. By accident I became a member of the House of Delegates to the A. M. A. and saw its inside workings. I would say there are probably some politics played in electing the president and selecting the meeting place, but outside of that they were looking out for the best interests of the profession at large. The men were earnest, honest and very able and looked after our interests in the best possible way. We met the officers like West, the Secretary; Woodward of the Medico-Legal Department of the Association; Colwell, Secretary of the Committee of Medical Education, Medical Licensure and Hospitals. We also met the very keen and efficient editor of the American Medical Association Journal, Dr. Fishbein. He was just as active and interested in the A. M. A. as any man man ever can be. You have now all had the pleasure of hearing him, and many of you have met him. There is nothing that I can say about him which will increase the high esteem which I am sure you all have for him. These men were very able, honest and hard working. They are doing everything possible for the best interest of the Association. We met the Chairmen of other important committees, and liked them. The Association is safe in the hands of men of that type.

I am sure we can all be proud of the work done by the American Medical Association, and we should all stand behind it strong, because the inroads upon our profession are of nationwide character. The American Medical Association is now going to have a full time man on the job in Washington during sessions of congress. Committees of the American Medical Association are at the present time studying the nursing question, and the safeguarding of medical expert testimony, in order that our profession may not be discredited in the public eye, as it often has been in the past. I am sure our State Association has had these problems in mind for some time.

There is another important matter for us to think about, and that is the ever-increasing cost of Hospitalization. I appreciate the high standard of our present hospital service, but we must not make this service so ideal and expensive that the average individual cannot avail himself of it without financially embarrassing himself. Remember that ten per cent of the public can pay any price; ten per cent are taken care of by the state or by charity; but it is the other eighty per cent that keeps our hospitals going, and from whom one might say we make our living. There is a limit to what the public can pay for this service and still pay the doctor. If this cost keeps mounting it will be one of the strongest arguments used for State Medicine.

The various standing committees have all worked in unison, and unselfishly devoted their time and paid their own expenses in doing things for the Association. I want to tell you that should the Association hire these gentlemen to work as they have and pay their expenses, I don't believe $100,000 a year would do it. Only those who can be useful on committees, who have the ability to put things across and who will leave their practice and attend meetings promptly can be of service to the Association. I have never appointed a man on any committee unless I felt he could and would deliver the goods. The honor connected with the appointment is ample compensation. The memory of effort expended and a duty well done is the only thing that is really worth while. To no single man is given the power, ability and skill to conduct an Association like this alone and do it well.

The officers from the President down, every committee man and every officer of the local societies, are cogs in the machine of this organization. Only by each one doing unselfishly his full duty and some more, will this association grow in numbers and fulfill the objects for which it was organized.

This whole machinery is only the servant of the individual members, and to them we are responsible. As a rule the servant only portrays the efficiency of the master. Therefore in the final analysis the Association will be as active as its individual members.

I say to you that every officer, committee man and member throughout the state has done everything within his power to help make the State Association of Minnesota one of the best and most active in the United States.

I especially want to mention and give credit to the traveling team, Dr. Braasch, Vice-President, Dr. C. B. Wright, Chairman Medical Program Committee, your toastmaster, Dr. Christison, and your councilor, Dr. Savage, and former President Burnap; I thank them for traveling with me and working for this new program.

Gentlemen, I hope as time goes by that the magic words "State Medical Association" will arouse in all of us a feeling of activity and willingness to come forward whenever our great organization needs us and calls for our assistance. I, therefore, appeal to each of you to let this be your slogan, "What can I do to make this a better and more useful Association?"

Let not this great interest you have all shown in the Association the last year and former years be one of a temporary or spasmodic character, but let it increase year by year as the Association assumes more activities and becomes more beneficial both to yourself and the public. I assure you it will if you will give the men at the head of it in the future the same unselfish and cordial support you have all given me.

THE WOMAN'S AUXILIARY

Address before the Medical Economics Meeting, By Mrs. J. T. Christison, President

When the proposition to organize the Woman's Auxiliary was first presented, I was not interested particularly, feeling that when the doctor's wife was needed, as in the case of a convention or a meeting of any kind, she as usual could be counted on; meanwhile, why the need of time given to meetings during the interim? However, that viewpoint has completely changed. I don't know whether the economic but certainly the political change for women has contributed greatly to alter the opinion as to the need of this organization not only in the minds of the wives of the doctors, but of the doctors themselves. They realize as do we what a power for strength we are.

It is stated in the constitution of the national organization that the objects of the Auxiliary shall be to supplement the work of the American Medical Association, to extend the aims of that organization through the members of the Auxiliary, to help educate public opinion relative to the advancement of health, to aid in securing better medical legislation, to promote fellowship among the members of the Auxiliary, and to do such work as may be assigned from time to time by the American Medical Association.

Think of the power that the wives of 150,000 members of the American Medical Association can wield if properly organized and informed. To bring it to Minnesota, think of the power that we 2,000 wives of Minnesota doctors can exercise here in Minnesota if bound together and instructed as to the wishes and aims of the medical association. For that reason, officers of the Woman's Auxiliary should have frequent conferences with the officials of the various medical societies, representing the county, state and national organizations. Dr. Johnson and Dr. Meyerding have been good enough to come to some of our board meetings this winter. Both made us feel that our help was welcome and needed.

The Woman's Auxiliary of the state can also aid in educating the people in their different communities regarding the program of the Minnesota Public Health Association for the prevention of diseases, and can disseminate that knowledge in their different groups.

Speaking of this marvelous age in which we are living, with its wonderful discoveries and strides in every direction, Mark Sullivan in a recent lecture in California said that in no one line in the last twenty-five years had there been the development and achievement that there had been in medicine. The public should know, without physicians seeming to have to advertise their wares or in any other way say anything that might seem to be or be unethical, that children may be saved from diphtheria, scarlet fever, whooping cough, as surely as from small-pox or typhoid fever. The United States may surely be called the teacher of the world in methods of preventive medicine. The people should know about the public health committee of which Dr. Savage is chairman, whose aim is to put before the citizens of the state just what regular medicine means to them, to explain the difference between the regular profession and the various cults, by means of radio talks, simple articles, or matters pertaining to health, the prevention of various forms of contagious and infectious diseases, the use of vaccines and serums, the use of various foods, sunshine, fresh air and clothing and water, the need for the examination of teeth and a pure milk supply for children.

The people should know that periodic health examinations for the apparently well individual are valuable. Some of the larger insurance companies are now giving their policy-holders this service. In response to a manifest demand on the part of the public for such examinations, it is becoming more and more evident that the regular profession will assume this as part of routine practice. In order to accomplish the desired result, these examinations will have to be thorough and complete in every detail, such as only competent, properly trained medical men are capable of.

It is my vision and hope that this coming year we may see an organization in every county and that in these various county organizations there will be this work accomplished: (1) the placing of a representative of the speakers bureau before each woman's organization in the county; (2) the gathering of information on health campaigns fostered by lay groups, for example, the round-up of the Parent-Teachers Association, school examinations or other activities of the county tuberculosis associations, pre-school child program of the Federated Clubs, mental hygiene activity on the part of the American Association of University Women, and so forth, to arrange conferences of officers of these associations with representatives of the county medical society for the rationalizing of these programs; (3) to interview the county newspapers for proper publication in which to use weekly health department columns over the signature of the local county medical society; (4) to discover just how much place is given to health education in public and parochial school systems, to present recommendations to the school board; (5) to seek out and extend courtesies to the wife of each new physician coming into the county, and to each eligible non-member of the county society (this would be of the greatest assistance to the membership committee of each county society); (6) arrange joint meetings with the county medical society in which there will be discussion of the county's health needs and of the legislative and educational policies of the general state medical society; (7) to encourage every physician's wife to be an active member of at least one organization other than the Auxiliary in order that the influence of the Auxiliary among laymen may be extended as widely as possible; (8) to arrange at least four study programs during the year for the purpose of gaining a thorough familiarity with the foregoing; to do everything possible to promote the feeling of friendliness and tolerance among physicians' wives to the end that the medical profession as a whole may present a united front to the onslaught of the quack and the cultist.

In this way I feel that we may help not only the medical profession but, what is far more important, the public.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association and Minneapolis Surgical Society.

Vol. IX NOVEMBER, 1926 No. 11

ACUTE LARYNGEAL OBSTRUCTION*

AN ANALYSIS OF INSTITUTIONAL CASE-HANDLING.

STUART W. ADLER, M.D.
Winona, Minnesota

There may be little or no excuse for this paper's presentation at a Medical Society meeting, and probably you will conclude that it is a case of the author astride his hobby. While there is a genuine personal interest in the subject on the part of the writer, the data collected seemed to contain enough information to warrant offering it at this time.

When one thinks of acute laryngeal obstruction of more than moderate degree, there are visions of unpleasant experiences for the patient, anxious moments for the physician, and an unfortunate outcome in many cases. Few if any emergencies require as prompt treatment as those where there is interference with breathing through obstruction of the principal airway to the lungs.

As you no doubt fully appreciate, the majority of acute obstructing conditions in and about the larynx occur as inflammations in connection with the group of infections designated, for convenience, as the communicable diseases of childhood. If we exclude simple or spasmodic croup, this is certainly true.

For the care of these acute obstruction cases, there exists today, in most large cities, special hospital service where isolation of the infections can be carried out and adequate facilities provided for the type of care indicated.

It is our purpose to bring to you the results of a study of the records of a representative group of cases of laryngeal obstruction. Certain conclusions were reached, which it was thought might prove to be helpful suggestions for those of you whose practice brings these cases to your attention occasionally. The material comes from a well established department of a hospital for communicable diseases operated by a large eastern municipality for its taxpayers.

The cases included number 443 and were seen in the course of a continuous two year period. It was the writer's good fortune to have practically all of them under his observation.

Let us view briefly the method of handling cases of laryngeal obstruction in this institution. A hurry call from a physician reporting a case of laryngeal diphtheria is received. The ambulance is dispatched, and a trained attendant is sent whenever possible, with instructions to get certain facts in the history of the case, and return with the patient as promptly as possible. Only if life is actually threatened is he to entube at the home or en route to the hospital.

Arriving at the hospital, despite the seeming urgency, the case is examined by a trained resident physician in the admitting room of the diphtheria pavilion. This examiner receives the history brought with the case, attempts to exclude the various exanthemata, and makes an estimate of the location and character of the obstruction.

Particular care must be used to exclude measles and scarlet fever. If the history of the case includes an exposure to any other communicable disease, special arrangements for isolation have to be made. If the degree of obstruction demands prompt relief, the patient is removed to a room fully equipped for further examination and treatment of these cases.

The equipment here includes everything that might be needed for laryngoscopy, bronchoscopy, intubation, tracheotomy, and so forth. The cases are subjected to direct laryngoscopy; cultures are taken from the larynx; loose membrane or foreign bodies, if present, can be removed, and the larynx swabbed, medicated, or dilated if desired.

If intubation is indicated, the resident physician orders the size and type of tube to be used, and personally supervises the interns in a reasonable number of attempts at intubation. Should the assistants be unsuccessful, the tube

*Read in abstract before the Minnesota State Medical Association, Saint Paul, May, 1926.

is then placed by the resident. The patient is observed in order to establish that relief has been secured; antitoxin is administered; additional cultures as indicated are taken, and the case is sent to a special ward located close to this operating room.

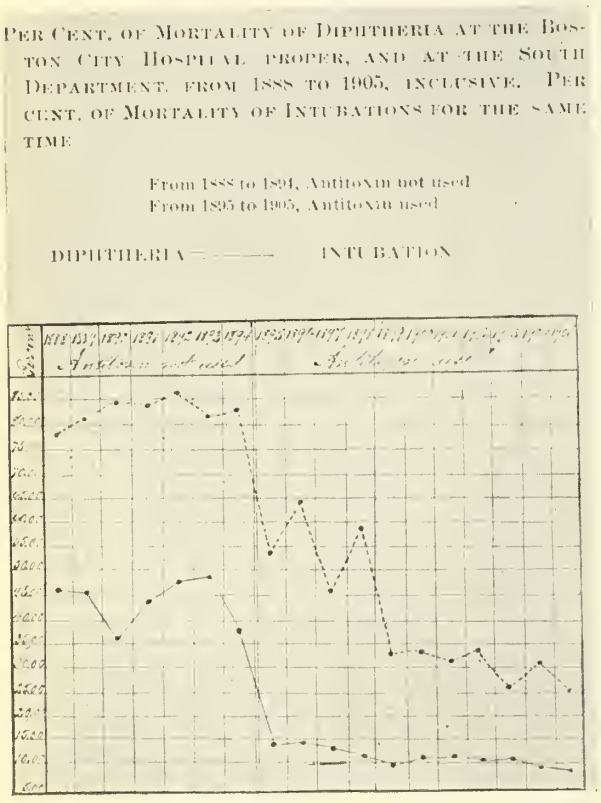


Chart A

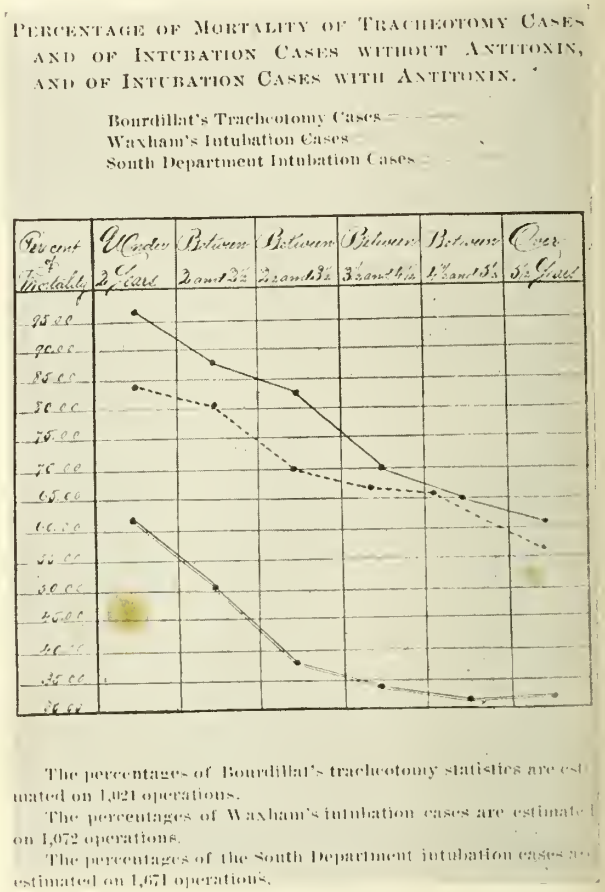
Chart A is self-explanatory and is introduced for the sake of comparison with the condition existing at the time covered by this paper. (Reproduced from McCollom's History of the South Department, Boston City Hospital.)

Very careful supervision by nurses assigned to this special duty is imperative. An emergency call system operating from this ward enables the nurse to summon the resident on duty should occasion demand.

Such a routine covers the handling of these cases and is attended by many thrilling experiences. Frequently interesting conditions arise which demand prompt judgment, and often the employment of emergency measures for their relief.

You may ask why these cases were receiving care in a diphtheria pavilion. Of this series of cases with obstruction, 305, or 69 per cent, proved to be diphtheria. The non-diphtheritic cases can be protected against diphtheria by administration of antitoxin, and their stay in the institution made reasonably safe by the accurate use of the Schick test. Occasionally a non-diphtheritic case contracts diphtheria or becomes a temporary carrier.

The cases here described include in addition to the diphtheria infections, a fairly large group of cases simulating diphtheria which demand the same kind of treatment for relief. Streptococci are isolated from some of these. If sufficient cultural studies could be made, a variety of or-



The percentages of Bourdillat's tracheotomy statistics are estimated on 1,021 operations.

The percentages of Waxham's intubation cases are estimated on 1,072 operations.

The percentages of the South Department intubation cases are estimated on 1,671 operations.

Chart B

Chart B is offered to show the extremely serious nature of cases of acute laryngeal obstruction due to diphtheria, before the days of antitoxin.

Both Bourdillat's and Waxham's statistics are based on cases in which no antitoxin was used. (Reproduced from McCollom's History of the South Department, Boston City Hospital.)

ganisms would probably be found responsible for the non-diphtheritic group.

Presenting interesting clinical pictures are the cases in another group, the greater number of which were sent in as diphtheritic obstruction because of the signs and symptoms. This series includes cases of measles, retropharyngeal abscess, epiglottic and subglottic edema, peritra-

TABLE 1
ADMISSIONS AND DISCHARGES
South Department Boston City Hospital

	1919-20	1920-21	1921-22	Total 1920-22
All admissions	2114	1917	1971	3888
Diph. admissions	995	872	1000	1872
Obstruction series	.....	201	242	443
Total discharges (including deaths)	2029	1901	2009	3910
Diph. discharges (including deaths)	.....	820	989	1809
Total deaths	128	148	132	280
Total mortality (percentage)	6.1	7.7	6.5	.....
Deaths within 24 hrs.	25	39	43	82
Deaths within 48 hrs.	40	60	52	112
Obstruction series				
Total deaths	.....	39	49	88
Deaths within 24 hrs.	.....	.....	.....	30
Deaths within 48 hrs.	.....	.....	.....	43
Mortality obstruction series (percentage)	.....	.....	.....	19.8

Note: 1919-20 is introduced for comparison. The two year period under consideration dates from Feb. 1, 1920, to Jan. 31, 1922.

TABLE 2
MONTHLY INCIDENCE OF ADMISSION

	1920 Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	1921 Jan.
Total admissions	211	185	169	181	149	142	95	92	120	143	207	223
Obstruction cases admissions	35	10	18	12	11	9	8	2	19	29	26	22

	1921 Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	1922 Jan.
Total admissions	153	196	201	193	139	107	109	101	170	200	107	195
Obstruction cases admissions	15	23	13	25	15	9	8	12	26	22	38	36

cheal inflammations, laryngismus stridulus, foreign body obstruction, laryngeal polyps, and others. Cases of laryngitis of varying degree, both simple and spasmodic, were not infrequently referred as suspected diphtheria, and occasionally admitted when there was a history of progressively increasing interference with breathing.

The 443 cases of acute laryngeal obstruction are a part of 3,888 admissions over the two year period covered. Of this total, the admission diagnosis was diphtheria in 1,872. When carefully analyzed, the diagnosis of laryngeal diphtheria was made in 305, or slightly over 16 per cent of all diphtheria admitted during the two year period (Table 1).

The total discharges from this institution closely paralleled the number of admissions each year and showed that approximately 7 per cent of all the cases died. In the series under consideration the deaths amounted to 19.8 per cent of the whole number of cases. Mortality from laryngeal obstruction of more than slight degree is high, though not as high as before treatment with diphtheria antitoxin was introduced, and intubation was more or less generally practiced. In this same hospital between 1888 and 1894 (that is before antitoxin was used) the diphtheria death rate was about 43 per cent, while mortality of obstruction cases which were intubed was 82.49 per cent.

The seasonal distribution of the admissions showed that the number of cases with obstruction was greatest in winter and spring; this in a measure corresponds with the high point among all admissions to the institution (Table 2).

There is practically an equal distribution of the sexes, both in the whole group and its subdivisions (Table 3).

Age grouping shows the usual preponderance of cases among children of pre-school age, although the largest number of cases is not in either of the first two years.

The case records under consideration divide themselves for convenience into obstructions due to diphtheria, non-diphtheritic inflammations with obstruction, and a small group of special conditions. Cases of obstruction due to diphtheria have been further subdivided into two groups, those with laryngeal involvement alone, and a larger group where the evidence of clinical diphtheria was found in the larynx and elsewhere.

The theoretical requisites for a diagnosis of diphtheria may be one thing, and the clinical evidence which forms a practical working basis for such diagnosis, another. Inflammation of the

TABLE 3
SEX DISTRIBUTION

	All cases		Deaths	
	M	F	M	F
Diph. Larynx	37	31	9	8
Diph. Larynx and elsewhere	112	125	23	20
Non-diph. with obstruction	59	57	12	5
Special	10	6	3	4
	218	219	47	37
		218		47
History wanting		6		4
Total		443		88

TABLE 4
ANTITOXIN DOSAGE

Group	Route used	*All Cases* No. cases	Average amt.	Largest dose	Smallest dose	*Deaths* No. cases	Average amt.	Largest dose	Smallest dose
Obstruction series	All	418	24	120	2	77	30	120	4
	Iv.	158	26	120	10	28	43	120	10
	Im.	70	20	40	3	14	19	40	10
	Sc.	171	18	80	2	34	19	80	4
All diphtheria	All	294	27.5	120	2	58	34.5	120	10
	Iv.	135	28	120	10	25	45	120	10
	Im.	43	24	40	3	9	24	40	10
	Sc.	99	21	80	2	24	23	80	10
Diphtheria larynx and elsewhere	All	228	30	120	2	42	40	120	10
	Iv.	114	30	120	10	23	49	120	10
	Im.	31	27	40	10	4	26	40	10
	Sc.	68	23	80	2	15	27	80	12
Diphtheria larynx alone	All	66	18	40	6	16	20	36	10
	Iv.	21	21	40	10	2	33	36	32
	Im.	13	16	30	3	5	22	30	10
	Sc.	32	17	34	6	9	16	34	10
Non-diphtheria with obstruction	All	112	15	70	2	14	16	40	4
	Iv.	21	18	40	10	2	35	40	30
	Im.	24	14	30	10	3	17	20	10
	Sc.	65	14.5	70	2	8	10.5	20	4
Special cases with obstruction	All	12	14	36	2	5	14	12	5
	Iv.	2	15	20	10	1	10	....	..
	Im.	3	11	12	10	2	12	12	12
	Sc.	7	11	36	2	2	8.5	12	5

Routes: All—all routes, Iv.—intravenous, Im.—intramuscular, Sc.—subcutaneous.

Note: The figures designating quantities of antitoxin are used to represent thousands of units of antitoxin. *i.e.*, 24 in the table above means 24,000 units of antitoxin. Any discrepancies in totaling the various groups can be explained by the fact that some cases did not receive antitoxin while others received it by more than one route, and are not included in the subdivisions of the various groups.

larynx associated with cultures positive for the diphtheria bacillus calls for a diagnosis of laryngeal diphtheria. To prove the virulence of all strains of organisms designated bacillus diphtheriæ is obviously beyond the facilities of the average hospital. To a certain extent we are aided in diagnosis by evidence of clinical diphtheria in locations other than the larynx. Response to treatment cannot be relied upon to offer assistance in diagnosis.

COMMENT

From the evidence collected in this series of cases there is little that is new to offer. The data presented serve to substantiate conclusions that have been arrived at previously, some of which however are deserving of being recalled to your attention.

Laryngeal diphtheria has a high mortality and the deaths in all cases of laryngeal obstruction due to diphtheria may be divided into those

TABLE 5
ANALYSIS OF DEATHS

Deaths—Time Relation to Admission

Group	No. cases	Death in 24 hrs.	Death in 48 hrs.	Days after admission: 3	4	5	6	7-14	Over 14
Diph. larynx	17	7	9	1	1	1	..	2	3
Diph. larynx and elsewhere	43	14	18	6	1	..	..	13	5
Non-diph. with obstruction	17	6	12	1	..	..	1	1	2
Special cases	7	3	4	..	..	..	..	2	1
History wanting	4								
Total	88	30	43						

Deaths—Age Distribution by Years

Group	1 & under	1-2	3-5	6-8	9-15	Over 15
Diph. larynx	4	5	6	2	..	..
Diph. larynx and elsewhere	3	12	18	5	2	3
Non-diph. with obstruction	8	6	2	..	..	1
Special cases	3	3	1	..	..	..
Total	18	26	27	7	2	4

Deaths—Days Sick Before Admission

Group	1	2	3	4	5	6	7 or over	Data wanting
Diph. larynx	3	2	..	1	1	..	2	8
Diph. larynx and elsewhere	2	5	5	4	5	5	2	15
Non-diph. with obstruction	4	1	1	..	3	..	1	7
Special cases	2	..	..	..	..	..	3	2
Total	11	8	6	5	9	5	8	32

Deaths—Relation to Complicating Factors

Group	No. cases	No. intubed	Pneumonia: A	B	C	Complications: Myocarditis	Paralysis	Toxemia
Diph. larynx	17	17	11	10	9	0	0	1
Diph. larynx and elsewhere	43	34	28	25	4	8	2	19
Non-diph. with obstruction	17	14	13	13	1	0	1†	4
Special cases	7	5*	7	4*	5	0	0	3
Total	84	70	59	52	19	8	3	27

Note: Under Pneumonia, A—total cases, B—intubed cases, C—pneumonia at entrance.
*Tracheotomies. †Facial paralysis in case with general tuberculosis.

from exhaustion, asphyxia, accidents in the mechanics of treatment, and pneumonia.

When only the larynx is involved, toxemia as a factor enters in far less than is generally supposed. The length of time patients are sick before treatment is started and the degree of obstruction are important as contributory factors. The exhaustion and diminished resistance when labored breathing is unrelieved are responsible, to a greater extent than toxemia, for many fatal cases or for the degree of illness encountered in others. In support of this contention it may be said that among the cases with only laryngeal involvement who survived the intubation period, in no case is there record of the characteristic toxic complications—paralysis or cardiac disturbance. This is true despite the fact that routinely this type of case due to diphtheria received smaller doses of antitoxin than any except nasal or mild follicular types of faucial involvement. In this series the average amount of antitoxin received by 66 cases with diphtheria of the larynx alone was 18,000 units as against 27,000 for all the diphtheria cases in the series and 24,000 for the entire group of obstruction cases (Table 4).

When the laryngeal involvement is accompanied by fairly extensive diphtheritic involvement in other parts of the respiratory tract or elsewhere, the danger depends upon additional factors. It is here that the time interval from onset of symptoms to proper treatment is most important, and the extent of the area involved is an index to possible toxic absorption. Unless the infection extends into the finer ramifications of the bronchial tree in cases with more than laryngeal involvement, the resultant toxemia is from absorption in regions about the throat and naso-pharynx rather than from the region below the glottis.

There is always the possibility of early absorption of toxin from smaller areas in the

TABLE 6

RECOVERED CASES IN OBSTRUCTION SERIES

Age Distribution of Cases

	One year and under	1-2	3-5	6-8	9-15	Over 15	Total
All diphtheria	6	37	120	59	12	4	238
Non-diph. with obstruction	14	21	37	14	9	4	99
Intubed Cases							
All diph.	6	25	84	32	6	..	153
Non-diph.	7	6	19	6	2	1	41
Complication							
Pneumonia							
All diph.	2	9	14	5	1	..	41
Non-diph.	5	2	1	..	..	1	9
Paralysis*							
All diph.	1	..	..	4	..	1	6
Myocarditis*							
All diph.	..	..	..	1	..	..	1

Days Sick Before Admission

	1	2	3	4	5	6	7	8	9	10	Over 10	No accurate history
All diphtheria	52	40	34	19	17	9	13	7	1	5	5	46
Non-diph. with obstruction	30	14	12	7	6	4	7	2	..	2	1	14

Days Stay in the Hospital

	1	2	3	4	5	6	7	8-14	15-21	22-28	Over 28
All diphtheria	..	..	..	..	..	3	..	18	73	49	95
Non-diph. with obstruction	..	2	2	4	6	6	5	22	24	8	20

*No cases among the non-diphtheritic group.

Note: The long stay in the hospital for many cases was due to the necessity of having cultures negative for the diphtheria bacillus from the nose and throat for three consecutive days before release.

course of the infection. If this is carried to vital tissues particularly susceptible to diphtheria toxin, there may be resulting damage. As a matter of fact, it is rarely seen. It is, however, one of the reasons why it is so important to get antitoxin into the blood stream as early as possible even though the quantity required be small.

In cases with extensive involvement, after the relief of the obstruction is accomplished, there is the necessity of getting the patients past the effects of the toxic damage to conduction tissues in the heart, and to the peripheral nerves. It is clearly pointed out that these cases are serious if antitoxin is not administered promptly and in adequate amount (Table 6).

Of the series of cases which had diphtheria in the larynx and elsewhere, the deaths numbered 43. Of these, 19 died with marked toxemia and in 8 cases myocarditis was present. Paralysis was noted in 2 cases where death resulted. The average number of days from onset of symptoms to death, based on 28 cases with definite history, was 4. The stay in the hospital for the 43 cases averaged eight days. If you exclude any who died after being in the hospital for twenty-one days or more, the average is brought down to 5. Obviously this is less time than is required for most cases to show the characteristic cardiac and nerve complications (Table 5).

If the amount of manipulation in mechanical treatment is increased above the minimum a proportionately greater incidence of deaths results. Where a record of the total number of attempts at intubation is studied, this contention is in part supported although more factors are responsible for death than the amount of instrumentation. Obviously it would be highly desirable to have all of the intubations done by skilled operators, but this is not always possible in a teaching institution where instruction in intubation is part of the program (Table 7).

If cases with laryngeal involvement are relieved by intubation and survive the treatment of the acute condition, there is still the danger of chronic stenosis of the larynx, which is quite another problem. No discussion of this problem is undertaken here. In this series are included only four cases, two of which died.

The problem of pneumonia is the most discouraging of all, for when relief from obstruction is accomplished and other factors are somewhat under control, pneumonia so often enters the picture, and claims a high proportion of the younger children. The location of the obstruction, the chances of infection because of the

TABLE 7

INTUBATIONS

Number of Occasions

	1	2	3	4	5	6	7	8	9	10	Over 10
Diphtheria larynx											
All cases	35	9	5	4	..	1					
Deaths	12	1	2	2							
Diph. larynx and elsewhere											
All cases	92	36	11	5	1	1					
Deaths	22	8	2		1						
Non-diph. with obstruction											
All cases	34	12	3	2	1					1	
Deaths	11	3	1								

Number of Actual Attempts

	1	2	3	4	5	6	7	8	9	10	Over 10
Diphtheria larynx											
All cases	15	7	7	6	4	2	4	..	2	..	7
Deaths	5	2	2	1	3	1	1	..	..	..	2
Diph. larynx and elsewhere											
All cases	46	23	19	17	8	7	7	4	2	4	10
Deaths	12	2	3	7	1	1	1	2	..	2	1
Non-diph. with obstruction											
All cases	15	9	7	3	3	3	4	2	1	..	5
Deaths	6	2	2	2	..	1	1	..	1	..	..

Note: By *occasions* are meant the various times it was necessary to remove the patient to the operating room to undertake relief of the obstruction present. In addition to the treatment at entrance, there were a number of times when it became necessary to reintubate patients, as for example, when tubes were coughed up or removed before relief was complete.

By *attempts* are meant the actual number of trials to place the tube in position in the larynx. Depending upon the degree of proficiency of the physicians, the attempts at intubation varied from a single effort, to many, before relief was secured.

very nature of the mechanical relief attempted, the lowered resistance of the patients on admission, and other factors, greatly increase the probability of contracting pneumonia. Once contracted, that disease is very difficult to combat, especially if the obstruction to breathing is still requiring mechanical relief.

Non-diphtheritic cases present difficulties similar to the diphtheritic. Especially is this true with regard to relieving the obstruction and combating the general toxemia. The mechanical obstruction is more apt to be due to edema and exudate than to membrane. The toxemia, when fatal, shows involvement of no special tissues unless it be those of the central nervous system when there is terminal depression. If, in addition to the laryngeal involvement, there is a cellulitis of the neck in either diphtheritic of streptococcic cases the condition is made much more serious. The deep cervical tissues are a source from which there is rapid absorption of toxin. Because of the anatomic relations in this situation, swelling often renders intubation impracticable or impossible and necessitates tracheotomy.

Pneumonia deaths occur with about equal frequency in the diphtheritic and non-diphtheritic groups.

Among cases in the group designated "special" many things occur which should be readily differentiated from diphtheria, and others are noted which if in any measure resembling diphtheria, should receive antitoxin promptly. Note especially measles. As an example this series contains several cases which had measles and diphtheria of the larynx coincidently and of course needed antitoxin. It is never a mistake to give antitoxin to a case of measles with beginning laryngeal stenosis. Retropharyngeal abscess, foreign bodies and laryngismus stridulus give sufficiently characteristic histories and clinical pictures so that they should be readily recognized.

Ingestion of corrosives and the various edematous swelling above and below the glottis may simulate diphtheria and may require intubation or tracheotomy. Certainly such patients should receive antitoxin to be on the safe side. It is not a good plan to incise a peritonsillar cellulitis due to diphtheria as was done in one

case mistaken for peritonsillar abscess. Death resulted less than 24 hours later. Careful histories in these cases will aid in the differential diagnosis.

Simple croup is but a form of laryngitis and when we are dealing with a diphtheria-immune community it will present less difficulty than at present. It is not enough that a physician see and prescribe for simple croup at a single visit. The case should be followed until it is apparent that there is a slight intermittent difficulty responding to appropriate treatment, rather than a progressively increasing stenosis.

In connection with tonsillectomy it has been wisely said that all cases should have a preliminary Schick test or nose and throat culture or both. It is probably safe to say that less than 1 per cent of tonsillectomies are preceded by this precautionary measure. Seven cases with one death in this series more than justify urging such a safeguard. The clinical picture after tonsillectomy is often difficult to distinguish from diphtheria and certainly it is easy enough for diphtheria to be superimposed upon the throat laid open by tonsillectomy in a susceptible individual.

With regard to handling laryngeal diphtheria or other cases with obstruction to breathing in the home or in a general hospital, it should be remembered that all facilities for any emergency must be provided and the patient be under constant attention of an attendant competent to meet these emergencies. This type of care is occasionally provided in the home, but it is obviously limited to special cases.

CONCLUSIONS

1. Laryngeal diphtheria is a very serious condition generally necessitating treatment in a special type of institution.

2. Deaths from laryngeal diphtheria depend upon many factors. In order to obtain the lowest possible mortality, there must be prompt recognition and early treatment by skilled attendants.

3. Many cases of laryngeal obstruction due to causes other than diphtheria require treatment similar to that given diphtheria cases.

4. Cases simulating diphtheria should receive diphtheria antitoxin.

5. It is highly desirable that special hospital services to provide instruction in the treatment of acute laryngeal obstructions be maintained. There will obviously be some disadvantage to the patients under these circumstances.

6. Universal adoption of active immunization against diphtheria should be urged as a means to promptly reduce diphtheria morbidity and mortality.

ACKNOWLEDGMENT

To Dr. E. H. Place, physician-in-chief of the South Department Boston City Hospital, the writer wishes to express his sincere appreciation for valuable teaching and for permission to use the case records, from which the data for this paper were secured.

Winona Clinic

O-IODOXYBENZOIC ACID IN THE TREATMENT OF INFECTIOUS ARTHRITIS

The Council on Pharmacy and Chemistry publishes a preliminary report on the treatment of infectious arthritis reported on by Drs. Young and Youmans. The authors report that they have treated forty-three cases of chronic arthritis of various types with o-iodoxybenzoic acid and had obtained marked improvement in 50 per cent and moderate improvement in 29 per cent. In some cases sodium iodoxybenzoate was used; in others ammonium iodoxybenzoate, prepared extemporaneously. The Council states that the results of further clinical trials must be awaited before a final evaluation of this method of treatment can be made. The drug is not commercially available at present. The A. M. A. Chemical Laboratory is prepared to examine salts of o-iodoxybenzoic acid when they are placed on the market. (Jour. A. M. A., Sept. 4, 1926, p. 757.)

YEASTONE (MERCK & CO.)

The advertising circular claims that Yeastone is "useful in chronic constipation, digestive disorders, acne, furunculosis and in the deficiency diseases" and asserts that "in therapeutic activity a 1½-grain pill corresponds to one yeast cake." New and Non-official Remedies, 1926, under "Yeast Preparations," discusses the propaganda that has been made in favor of the therapeutic use of vitamin B preparations, and states that "at all events, the alleged curative or tonic value of special vitamin B bearing products has been emphasized through widespread advertising to an extent unjustifiable by available evidence." A report of the Connecticut Agricultural Experiment Station reports feeding trials with Yeastone: "No satisfactory growth was secured in any of the trials. Two cases developed polyneuritis, one of which was acute. The results do not show any merit in the product from the standpoint of water-soluble B vitamin." (Jour. A. M. A., Sept. 25, 1926, p. 1055.)

X-RAY OBSERVATIONS IN PNEUMONIA*

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In view of the extensive utilization of the roentgenogram in the diagnosis and observation of chronic lung conditions, it is surprising that more attention has not been paid to its importance in the acute pulmonary infections, especially the pneumonias. The pathological condition in pneumonia is such that it can be reproduced very clearly by the means of the roentgen ray. The large amount of heavy exudate thrown out into the alveolar cavities produces a distinct shadow, sharply in contrast with the remainder of the air-filled lungs. The mediastinum and diaphragms afford a ready means of ascertaining the pressure changes which are taking place in the thoracic cavity and help to demonstrate the effects of the formation of scar tissue. In the case of the acute lung conditions the roentgenogram, in truth, presents an "autopsia in vivo," requiring only adequate and intelligent interpretation to make it the most valuable adjunct in the diagnosis and study of pneumonia. By means of serial roentgenograms, taken at intervals, the changes taking place from time to time may be studied and appraised. No better method exists for the pre-mortem study of lung pathology. Frequently the difficulties in interpretation are found to compare favorably with those experienced by the pathologists in the gross examination of the tissues. Sante[1] has recognized this and has, by this means, presented considerable new information as to the onset and course of pneumonia. The following findings are based upon the observation of over 450 cases of pneumonia and other acute pulmonary conditions in which serial roentgenographic studies were made at the Minneapolis General Hospital.

When dealing with acutely ill patients the technic becomes a matter of considerable importance. A bedside *x*-ray machine was used during the acute stages of the illness. The film was placed underneath the patient, the tube above; he was moved slightly and then held his breath for one or two seconds, following which the film was removed. Every attempt was made to avoid undue exertion and, with the use of a bedside machine, the patient was put to much less inconvenience than for even a superficial physical examination.

The first question that arises in an acute pulmonary condition is whether or not there is parenchymal pathology present. This is of particular importance in two groups of cases, especially in children. In the first group we have those cases in which an acute abdomen, commonly acute appendicitis, is suspected and it is difficult to be certain that the findings are not due to beginning right lobar pneumonia. We have found the roentgen examination of the lungs so valuable in this group of cases that it is now a routine procedure at the General Hospital in all children suspected of an acute abdominal condition. A surprisingly large number of cases have had a clinical diagnosis of acute appendicitis made only to find a lobar pneumonia on *x*-ray examination (Fig. 1A). On the other hand, in the presence of an acute abdominal condition, we have found dullness at the right base and coarse râles which threw grave doubt on the advisability of operation. A roentgenogram in these cases reveals a high fixed diaphragm, due no doubt to the splinting effect of pain, without any abnormal pulmonary shadows, thus ruling out pneumonia (Fig. 1B). In the second group of cases we have the difficult task of deciding whether a child has acute bronchitis or bronchopneumonia. These cases present symptoms of pneumonia often without consolidation being present. It is obviously importaant from the standpoint of treatment and prognosis to make this determination. An essential difference between acute bronchitis and bronchopneumonia exists in the roentgenogram. The latter has, in addition to the marked congestion and the prominent vascular markings of the former, small or large clumped shadows or nodules which are easily distinguished from the streaked narrow shadows of the congested vessels.

Lobar pneumonia may arise in two ways. If seen early enough the shadow may be entirely peripheral, a triangular, homogeneous opacity with its base at the periphery, its apex at the hilum (Fig. 1C). This will most often be seen to extend to a whole lobe after a day, although occasionally in children it goes no further. The

*From the Department of Roentgenology of the Minneapolis General Hospital.
Presented before the annual meeting of the Minnesota State Medical Association, St. Paul, May 17-19, 1926.

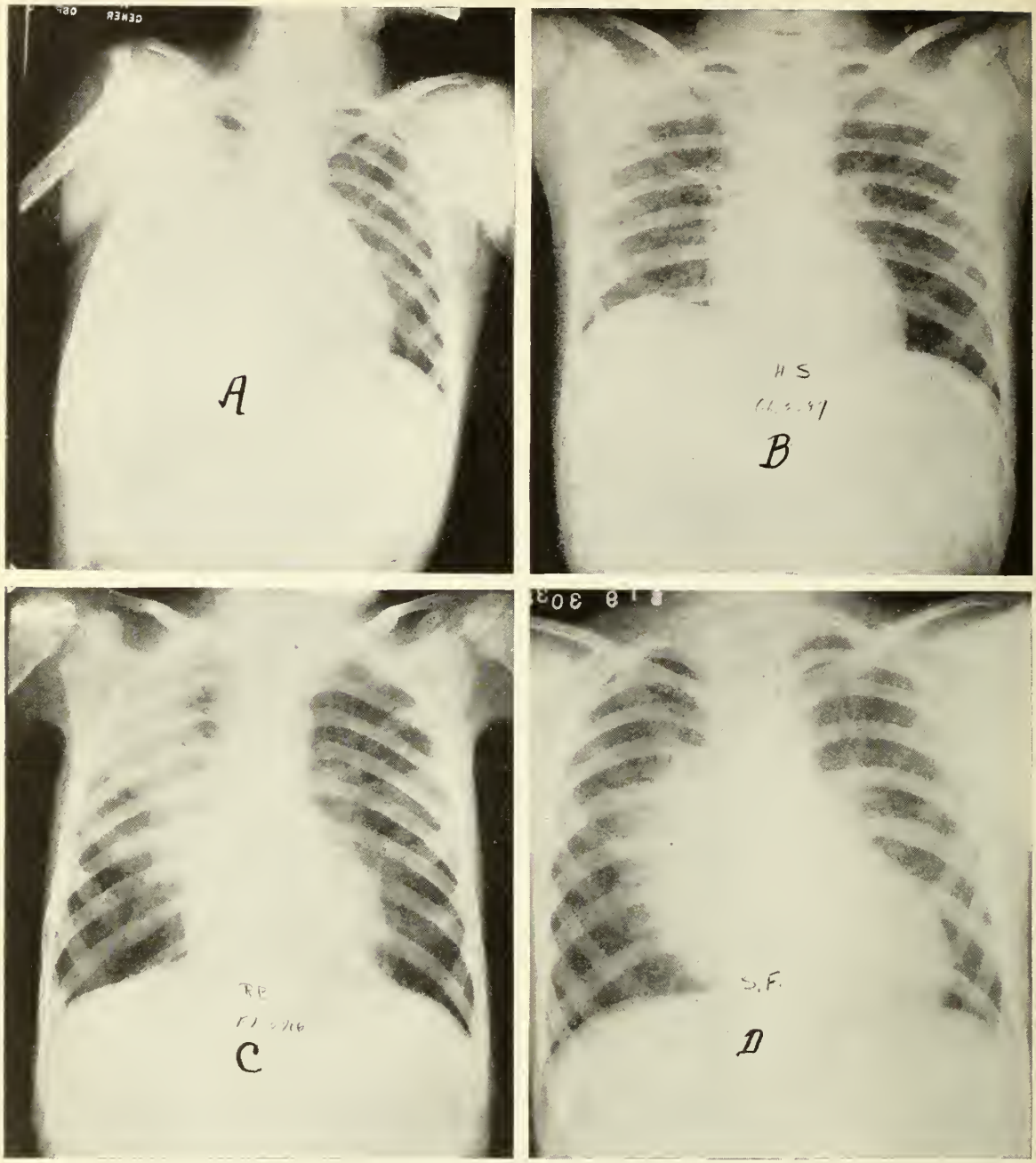


Fig. 1. A. Case suspected of acute appendicitis. Note typical heavy shadow of lobar pneumonia shown 24 hours after onset of symptoms. Patient complained of pain in McBurney's area.

B. Case of acute appendicitis with physical findings in right lung suggestive of beginning pneumonia. Note the high right diaphragm and decreased aeration of right lung.

C. Peripheral form of onset of right upper lobar pneumonia. Note the dense triangular shadow with base at periphery.

D. Central form of onset of lobar pneumonia. There were no physical findings at this time owing to the deep-seated location of the consolidation.

other and less common mode of onset in adults, but probably more common in children, is the central origin. A large, fairly dense shadow will be seen extending out from the hilum toward the periphery, somewhat rounded with an irregular, blurred outer border (Fig. 1D). In most cases, this extends out to involve a whole lobe or possibly a whole lung within one or two days. Not infrequently in children there is no extension, the whole process remaining central and resolving

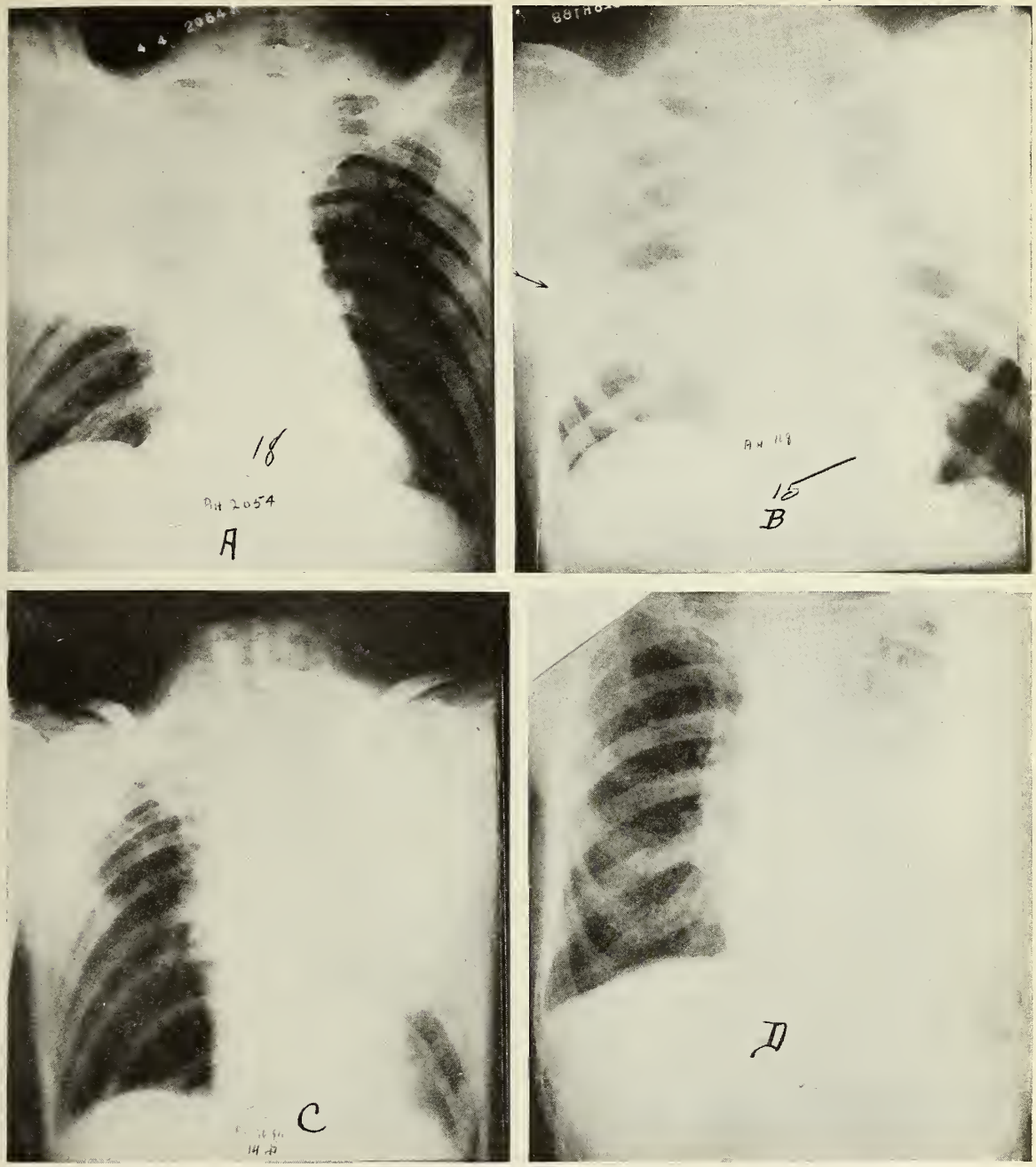


Fig. 2. A. Right upper lobar pneumonia. Note the sharp lower border of the shadow.

B. Right middle lobar pneumonia. Note the sharp upper border and blurred lower border of the consolidation.

C. Left upper lobar pneumonia. Note the density of the shadow in its upper portion and its thinness in the lower portion.

D. Left lower lobar pneumonia. Note the thin shadow in the upper portion and the denser character of it in the lower portion.

there. These are the cases which puzzle the clinician; the patient has all the classical symptoms of pneumonia without any of the characteristic physical signs. The pathological process is so deep-seated that the physical findings are not apparent at the surface and the consolidation is extremely difficult to detect. I have seen only one such case in an adult. The roentgen examination is very clarifying under these circumstances. Abortive pneumonia may also occur in this type of case. We have found that most of the cases diagnosed abortive pneumonia clini-

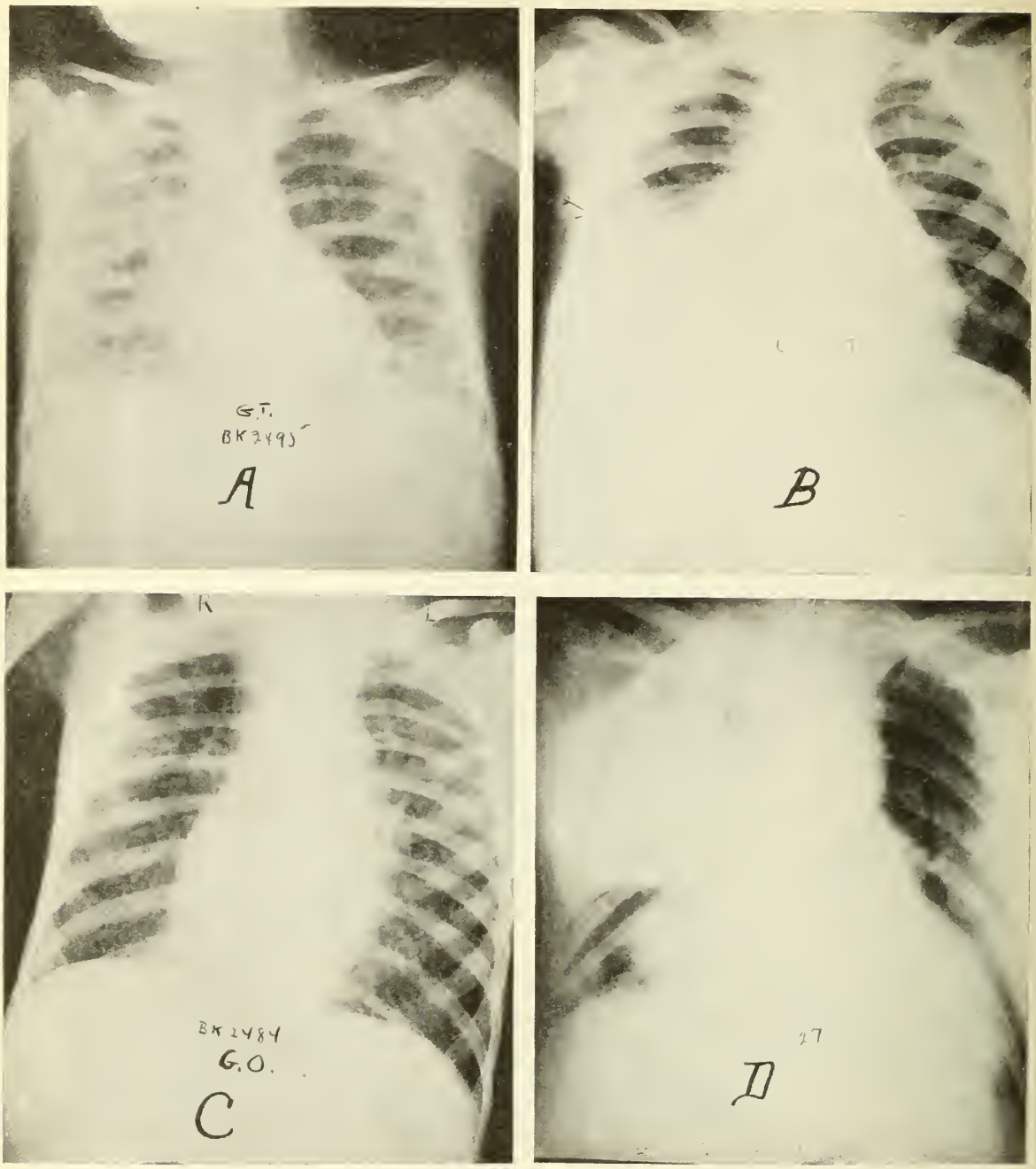


Fig. 3. A. Multiple bronchopneumonia. Note the nume rous smaller and larger densities throughout the lungs in addition to the increased vascular markings.

B. Coalescent bronchopneumonia. This is shown by an irregular mass at the right base in addition to several smaller shadows above.

C. Capillary pneumonia following measles. Note the multiple small nodules from apex to base on both sides and some tendency toward coalescence in both upper lobes. The resemblance to acute miliary tuberculosis is marked. This patient had a congenital heart lesion also.

D. Extension of lobar pneumonia. The right upper lobe is completely consolidated and a central consolidation in the middle and lower lobes is shown, the latter two not being completely consolidated as yet.

cally, show no consolidation whatever and are no doubt severe cases of acute bronchitis. We have, however, recently seen a case in which the first roentgenogram (Fig. 4A) was made twenty-four hours after the onset of symptoms and showed a central consolidation extending into the left lower lobe. Within twenty-four hours all the symptoms had disappeared and likewise the *x*-ray

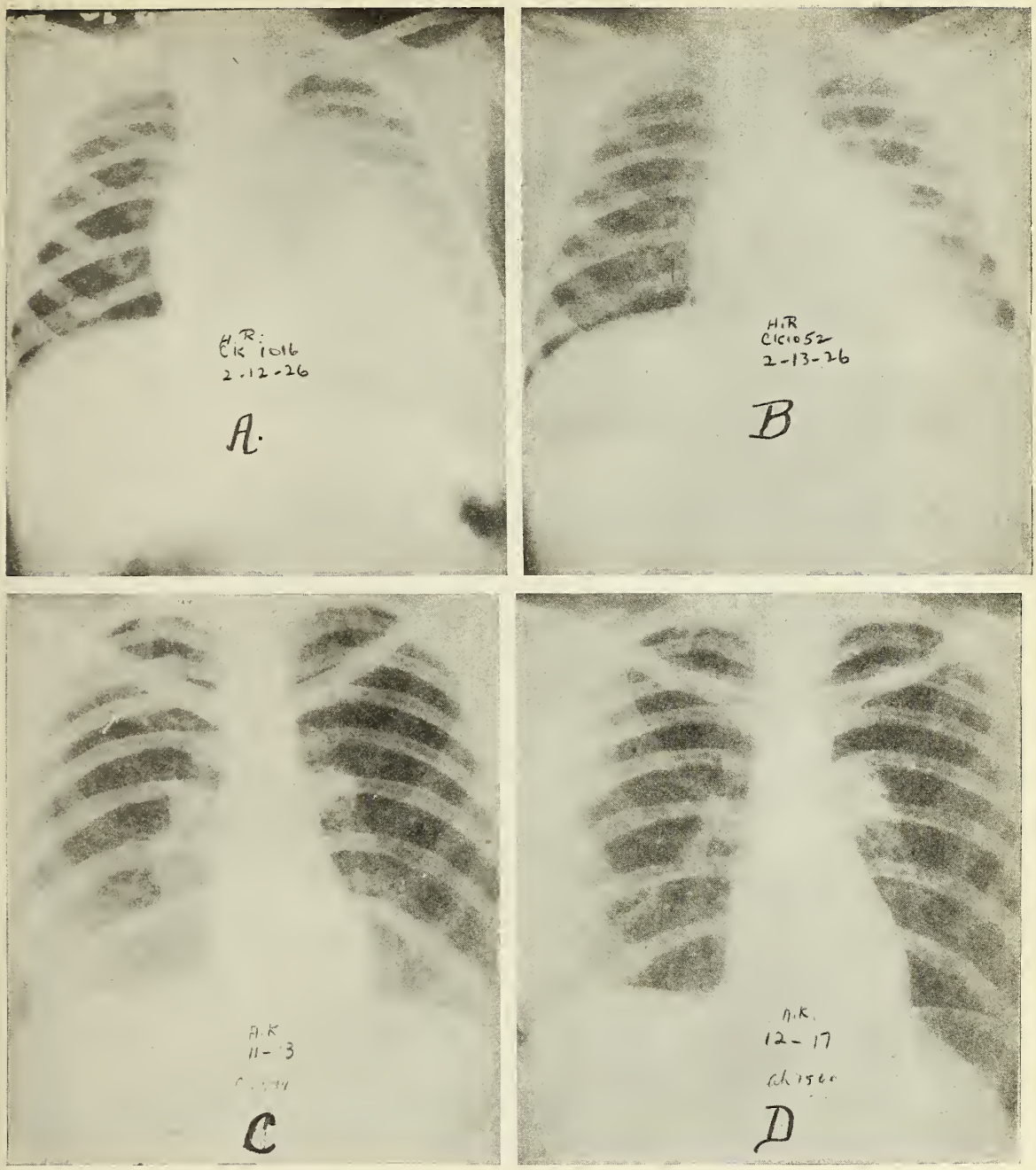


Fig. 4. A. Abortive pneumonia. Shadow present in left lung twenty-four hours after onset typical of lobar pneumonia of central origin.

B. Same case twenty-four hours later. The physical signs and the symptoms had all disappeared and likewise practically all the shadow which was present.

C. Localized bronchopneumonia associated with influenza simulating early tuberculosis. Note the shadow in the right subclavicular region characteristic in type and location of early adult tuberculosis.

D. Same case five weeks later. The shadow has entirely disappeared along with the symptoms indicating complete resolution and its non-tuberculous character.

findings (Fig. 4B), the lung being entirely clear. This, however, is extremely unusual.

Because of the difference in the distribution of the lobes in the two lungs, there is an essential difference in the type of shadow produced by lobar pneumonia on each side. Right upper lobar pneumonia (Fig. 2A) is characterized by a dense shadow, the lower border of which is sharply defined and almost straight across from the lateral to the medial border of the lung. In

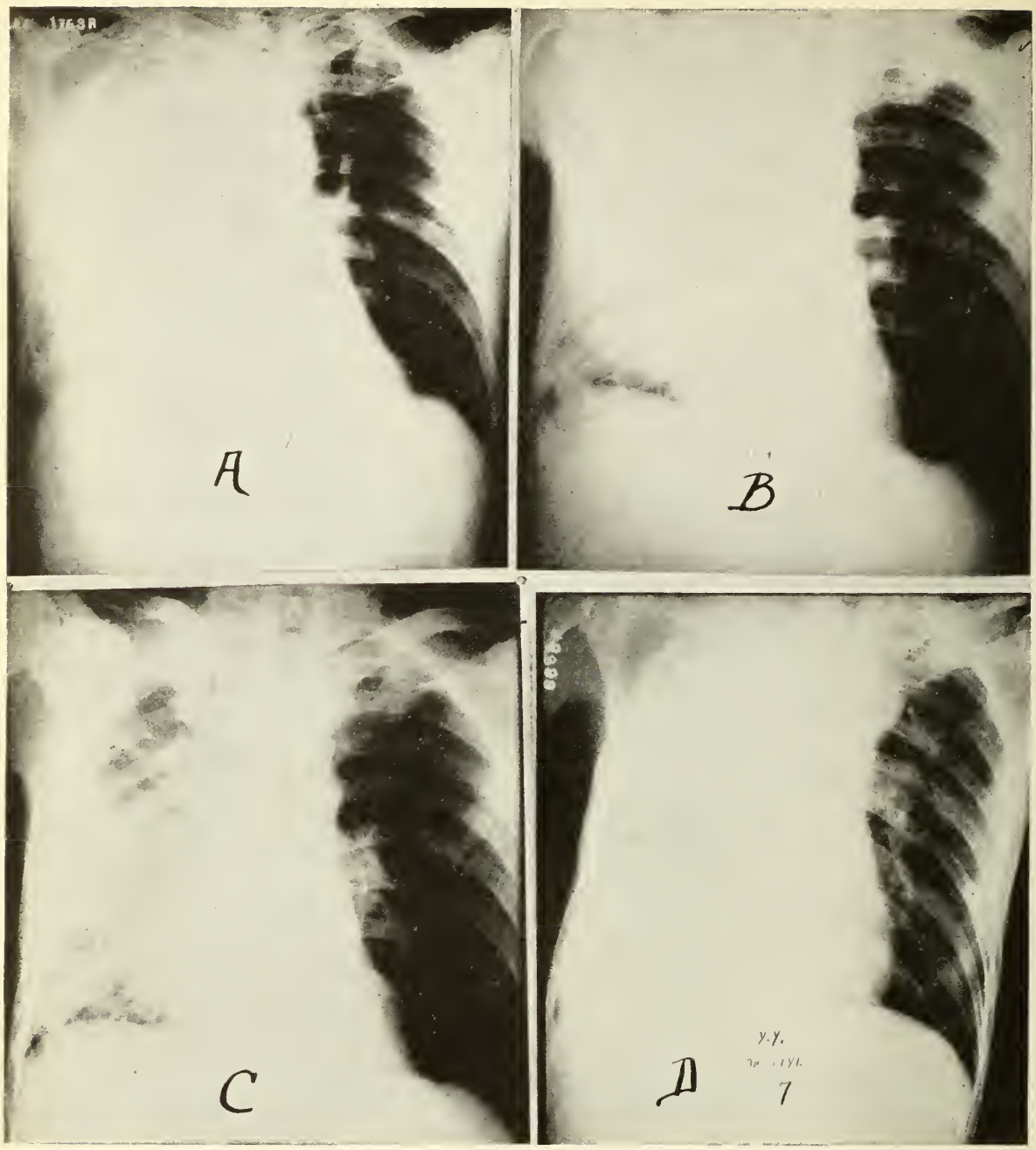


Fig. 5. A. Resolution of right lobar pneumonia. Findings at crisis. The shadow is still dense and homogeneous.

B. Same case twenty-four hours later. There is marked increase in resolution, many clear areas now appearing.

C. Same case six days after crisis. Note the multiple feathery masses and the marked peribronchial infiltration which are still present.

D. Unresolved pneumonia six weeks after the acute condition had subsided. There is a dense, sharply demarcated shadow in the right upper lobe which at post-mortem proved to be organizing unresolved pneumonia. There was also a small encapsulated empyema at the base as shown.

right middle lobar pneumonia (Fig. 2B) the upper border is also sharp and straight, corresponding to the lower border of the upper lobe. The lower border of the middle lobe is not well defined, tends to be blurred, and extends rather obliquely, forming a triangle with the base at the hilum. Usually right lower lobar pneumonia is combined with the middle lobar and tends to form a shadow extending up to the middle of the lung. If the focus of the tube is high enough, a clear space can be seen between the lower border of the consolidation and the diaphragm.

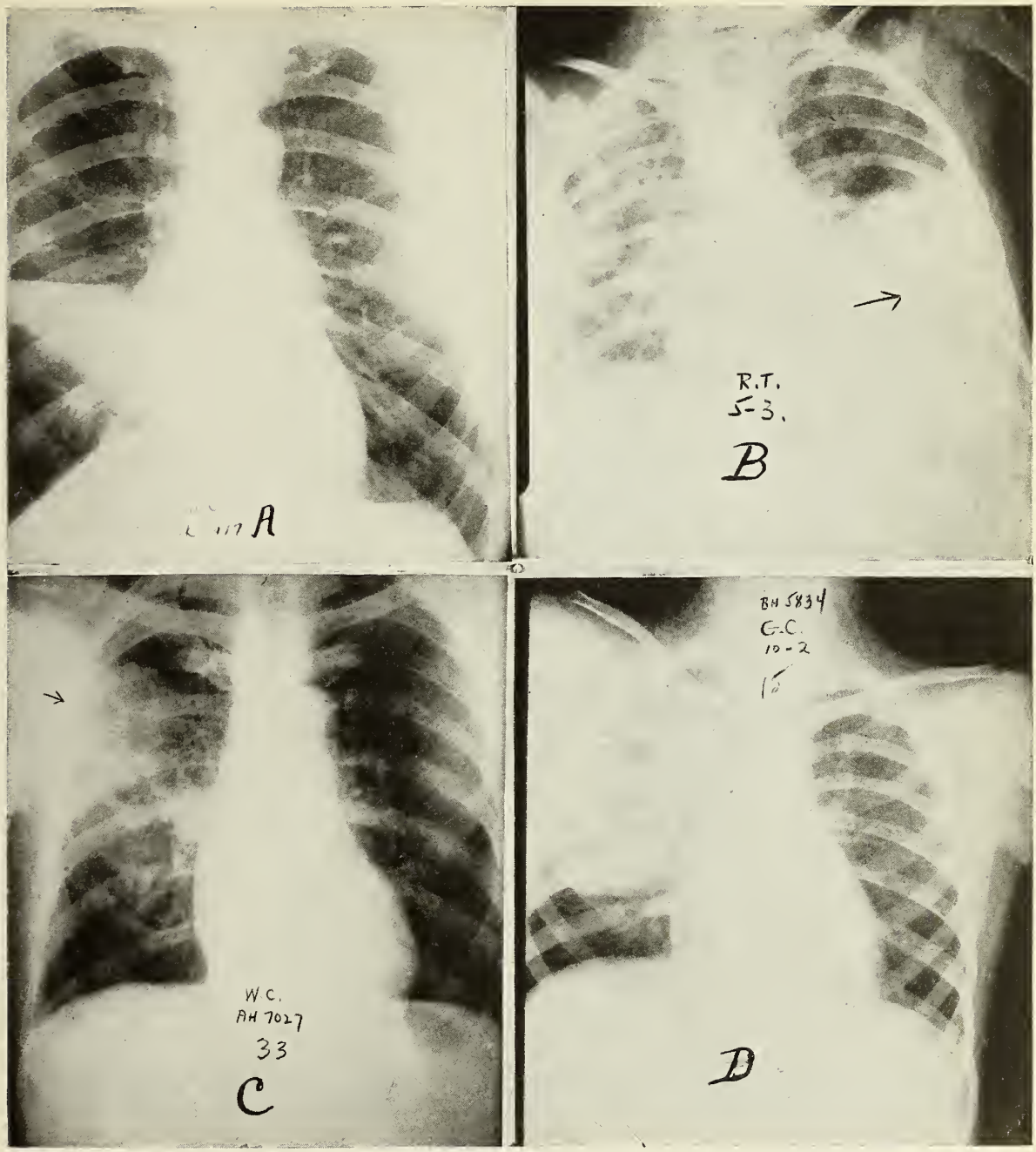


Fig. 6. A. Interlobar and diaphragmatic pleurisy following pneumonia. Note the triangular shaped shadow between the middle and upper lobes on the right with its base at the hilum characteristic of interlobar empyema. Note also the tent-like projection in the inner portion of the diaphragm.

B. Resolving pneumonia in the right lung and beginning empyema in the left. Note the dense, homogeneous shadow, the obliteration of the diaphragm and costophrenic sinus, and the slight displacement of the heart and trachea to the right.

C. Acute pulmonary abscess. Note the feathery edge of the shadow in the right upper lobe, its irregularity, and the area of clearness within it.

D. Encapsulated empyema in the upper lobe. Note the sharp rounded border, the lack of lobar distribution, and the loculated character of the shadow.

This helps to distinguish lower lobar pneumonia from pleural effusion. On the left side, the difference lies chiefly in the absence of the sharp interlobar lines, due to the oblique direction of the lobes and the fact that the upper lobe extends down so far anteriorly while the lower lobe extends upward posteriorly. As a result, in left upper lobar pneumonia (Fig. 3C) there is a dense shadow extending from the apex to the third interspace anteriorly and a thinner shadow extend-

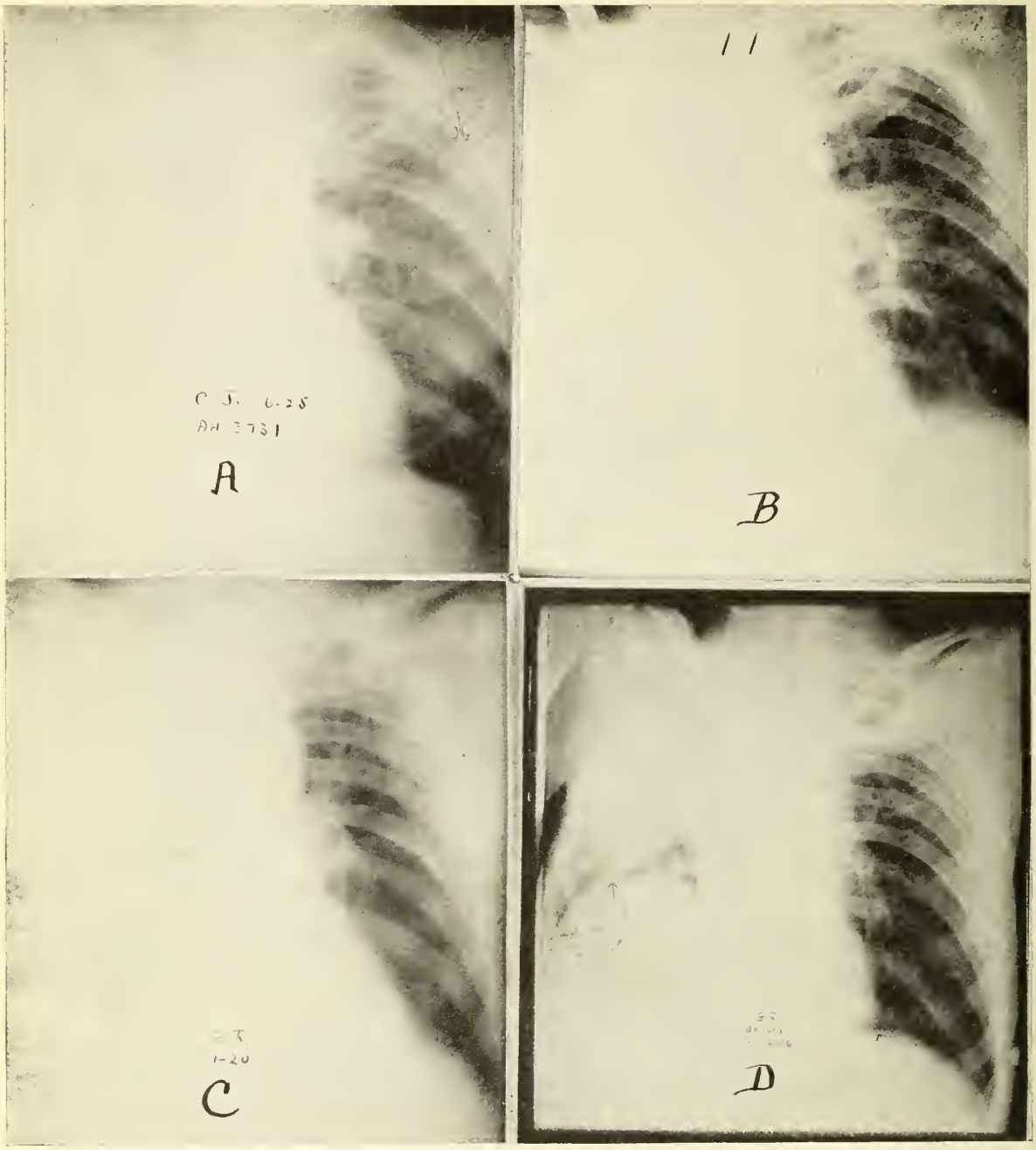


Fig. 7. A. Case of post-pneumonic lung collapse. Film taken before onset of collapse showing typical whole right lobar pneumonia. Note the normal position of the diaphragm, heart, and trachea.

B. Same case seven days later and twenty-four hours after a severe attack of dyspnea and cyanosis. The displacement of the heart and trachea toward the side of the lesion are well shown.

C. Case of unresolved pneumonia and post-pneumonic lung collapse. First film taken shortly after onset of lobar pneumonia shows typical whole right lobar pneumonia. Note the dense shadow throughout the whole right lung with the clear area above the diaphragm characteristic of lower lobar pneumonia. Note the normal position of the diaphragm and mediastinum.

D. Same case twenty-two days later. Note the dense shadow in the right upper lobe representing unresolved pneumonia. The high right diaphragm and the marked displacement of the mediastinum toward the side of the lesion are well shown. At post-mortem organizing pneumonia in the right upper lobe and extensive atelectasis in the lower lobe were found confirming the roentgen diagnosis.

ing down to the fifth rib. Likewise left lower pneumonia (Fig. 3D) shows a dense shadow just above the diaphragm up to the fourth rib anteriorly with a thinner shadow extending up to the third rib posteriorly.

Bronchopneumonia may manifest itself as a

number of dense shadows of smaller or larger size scattered diffusely throughout both lungs (Fig. 3A). Frequently the small patches of consolidation coalesce, producing a fairly opaque shadow, irregular in type (Fig. 3B). Following measles, we have seen a number of cases of capillary pneumonia (Fig. 3C). In this condition the lungs are dotted with small densities from apex to base. The picture closely resembles that of acute miliary tuberculosis except that the nodules are somewhat larger and tend to coalesce more. Clinically, these patients resemble miliary tuberculosis also, tachypnea and cyanosis being prominent signs. Usually they clear up within a week or two, which determines the diagnosis finally. This type of picture is seen very seldom and seems to have been unusually prevalent in this present epidemic of measles.

Another form of bronchopneumonia which we have observed recently in a number of cases is very easily confused with early tuberculosis both clinically and roentgenologically. In these cases, during the course of a fairly mild, acute, respiratory infection, somewhat resembling mild influenza, the temperature never rising above 102° F., *x*-ray examinations of the chest were made. A moderately heavy shadow, varying in size, was found in the right subclavicular region, its appearance and location being typical of early adult tuberculosis (Fig. 4C). Nevertheless, in a period of three to six weeks, re-examination (Fig. 4D) revealed no shadow whatever indicating that complete resolution had been accomplished. This never occurs in tuberculosis without leaving some characteristic residue. The process is simply a localized bronchopneumonia associated with an attack of influenza.

The progress of pneumonia can be well demonstrated by serial roentgenograms from day to day. Extension of the process to involve a whole lobe, a whole lung, or even both lungs, is well shown. We have observed one case in which the process began in the right upper lobe. A few days later a roentgenogram (Fig. 3D) revealed a consolidation in the center of the right middle lobe and another in the lower lobe. At this time each lobe could be distinguished by the consolidation within it. In other cases the complete extension of a fulminating pneumonia to involve both entire lungs has been observed with eventual death. In the bronchopneumonias, coalescence (Fig. 3B) may thus be observed, producing a graver prognosis.

When crisis occurs there is little or no change in the appearance of the roentgenogram (Fig. 5A). Within twenty-four hours, usually, a slight breaking up of the dense shadow may be made out (Fig. 5B). As resolution continues, a very characteristic picture (Fig. 5C) is presented wherein the lung is mottled with irregular feathery masses. Peribronchial infiltration is finally shown and within ten to twelve days in the ordinary cases the resolution may be complete. During the last epidemic resolution took place much more slowly, many of our cases remaining unresolved for several months, with eventual clearing. Unresolved pneumonia is not really as infrequent as it was once believed to be. We have seen a number of cases presenting a very dense shadow (Fig. 5D) months after a pneumonia which at post-mortem proved to be organizing, with small multiple abscesses within it. Occasionally these cases are mistaken for lung abscess, encapsulated empyema, and lung tumors. They can be differentiated from abscess, roentgenologically, by their sharper border and lack of cavitation. Encapsulated empyema is not lobar in distribution, tends to produce a triangle with its base at the hilum rather than at the periphery, and is usually more homogeneous. Lung tumors cannot be differentiated unless the patient has been studied by serial roentgenograms. In many cases resolution may take place to a large extent, leaving small residues near the hilum which may remain for long periods of time, often giving symptoms. Interlobar pleurisy, especially on the right side, is a very common residue, occurring in lobar pneumonia with great regularity and often remaining permanently. This is manifested by a sharp, white line of varying thickness, corresponding in location to the interlobar fissure. Interlobar empyema (Fig. 6A) may give a diamond-shaped shadow or a triangular-shaped shadow with its base at the hilum. The fact that many small interlobar empyemata resolve spontaneously is shown by repeated *x*-ray examination. Diaphragmatic pleurisy (Fig. 6A) is also a frequent accompaniment and may manifest itself permanently by tent-like projections and a high position of the diaphragm.

The early determination of the onset of empyema or a serous pleural effusion is of consider-

able importance and is often difficult to diagnose from the physical signs and symptoms. The roentgen appearance of pleural effusion is characteristic. The shadows of the diaphragm and costo-phrenic sinus are obliterated; the heart and trachea are usually displaced to the opposite side; in many cases a typical "fluid level" may be made out. By serial roentgenograms the time of onset of the complication (Fig. 6B) may be determined with accuracy, and prompt treatment may be instituted. In a few cases there is difficulty in distinguishing unresolved pneumonia from effusion. The former does not give as homogeneous a shadow as fluid and does not exhibit the cardinal signs described above. The other common complication of pneumonia, acute pulmonary abscess (Fig. 6C), is also difficult to distinguish from unresolved pneumonia. Lung abscess is not lobar in distribution, has an irregular, feathery outer border, and may show an area of lessened density in its center, the area of necrosis. Encapsulated empyema may also occur outside the interlobar line (Fig. 6D). This is sharply demarcated, may show loculation within it, and is usually rounded. A lateral view may demonstrate it to be attached to the anterior or posterior chest wall.

We have observed in three cases an unusual type of complication which could readily be determined only by *x*-ray examination. During the course of lobar pneumonia, about six days after the onset, there developed, in one case, a sudden attack of dyspnea, cyanosis, and extreme distress, remaining for about twenty-four hours. A roentgenogram (Fig. 7A), taken before this attack, revealed a typical lobar pneumonia involving the whole right lung. The heart, trachea, and diaphragm were in normal position. Another film (Fig. 7B), taken shortly after this attack, revealed the heart and trachea displaced markedly to the right, to the side of the pneumonia, not away from it as in pleural effusion. The diaphragm on the affected side moved upward. Eventually resolution took place although it was prolonged, and the mediastinum was replaced in normal position. In another case the process went on to involve both lungs, terminating in death. The whole appearance is typical of atelectasis or pulmonary collapse, which evidently supervenes as a complication affecting those alveoli which are not consolidated. The movement of the diaphragm upward, of the mediastinum toward the side of the lesion is characteristic of pulmonary atelectasis and can be well demonstrated in the roentgenogram. In another case it occurred in association with unresolved pneumonia of the right upper lobe. In this case there was first shown the typical appearance of whole right lobar pneumonia (Fig. 7C). Resolution took place in the middle and lower lobes but the upper lobe remained solid. The diaphragm was then observed to move upward and a diagnosis of sub-diaphragmatic abscess was considered. The heart and trachea, however, were displaced toward the side of the lesion, identifying it as a pulmonary collapse (Fig. 7D). At post-mortem. organizing pneumonia of the right upper lobe was found with extensive atelectasis in the lower lobe. This condition must be distinguished from post-operative massive collapse of the lung in which the atelectasis comes on shortly after operation or injury without any preceding pneumonia or infection.

SUMMARY AND CONCLUSIONS

1. The roentgen examination of the lungs affords an excellent means for the diagnosis and study of acute pulmonary conditions and can often reproduce the pathology very exactly.

2. The presence of pneumonia, its type, distribution, and extent can be accurately determined in this way.

3. Particular attention is directed to capillary pneumonia following measles and a form of localized bronchopneumonia simulating early tuberculosis.

4. Serial *x*-ray studies will demonstrate extension of the pneumonic process and the various stages of resolution.

5. Unresolved pneumonia and other residues can be determined definitely. Interlobar pleurisy is seen very frequently following lobar pneumonia.

6. The complications of pneumonia, especially empyema, can be diagnosed very early in the roentgenogram.

7. An unusual complication of pneumonia, pulmonary collapse, is described in detail.

REFERENCES

1. Sante, L. R.: Am. Jour. Roentgenol. 10, 351, 1923. Radiology, 4, 221, 1925.

SURGICAL TREATMENT FOR RESIDUAL INFANTILE PARALYSIS*

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Before any operation is undertaken, the first duty of the surgeon is to be sure that the patient is a proper subject, that the operation is the proper one for the lesion, and, last but not least, that the time selected is the proper time. This is particularly true of operations for infantile paralysis. Although a multitude of procedures have been advocated for the relief of various residual disabilities and deformities that follow anterior poliomyelitis (and it is difficult to describe in a general way the operative treatment of infantile paralysis) I shall endeavor briefly to outline certain basic principles.

SELECTION OF CASES

Sufficient time must have elapsed between the onset of the disease and the time of operation to make certain that the maximum of improvement has occurred in the paralyzed muscles. No definite time can be set, but it is generally accepted that plastic operations should not be performed within less than eighteen months. If there is deformity, manipulations or tenotomy may be necessary within less time. As a rule, some idea of the degree of power that can be expected to return in a given muscle can be obtained within a year. If paralysis of both lower extremities is complete and there is no deformity, it is very evident that operation will not help the patient. Such a patient may, by the aid of crutches, manage to drag himself about by tripod walking. The late Dr. R. W. Lovett made the statement, "Patients who come with infantile paralysis to the surgeon might be divided into two distinct classes: those who cannot walk and wish to walk; and those who can walk but wish to be made to walk better." The paralysis may be so distributed that operation is of questionable value, particularly in cases in which the hip muscles are paralyzed, while the foot muscles are fairly good. In some such cases if the hip were less involved, one might consider, for example, transferring the peroneus longus to the inner side of the foot to aid a weakened tibialis anticus, but because of marked disability higher in the leg is hardly worth while. If such operation is performed the patient or the parents should be warned that the operation will not relieve the limp which is due to a paralysis of the hip. The social status of the patient is an important factor in treatment. If he is a wage earner with a dependent family, stability must often be secured at the cost of comfort. A stiff hip or knee is uncomfortable in certain conditions, such as sitting, but it may give sufficient stability to allow the patient to stand for long hours without fatigue. In cases of this type more than any other, each patient should be studied to ascertain the treatment which will be most beneficial. No age limit can be set arbitrarily for operative procedures. If tendons are transferred, the patient must be mature enough to coöperate intelligently in the training of the muscle in its new duties. Rarely will a child less than eight years of age coöperate in this manner. Arthrodesis is best carried out about puberty or later, but operations for the correction of deformity may be performed at any age.

TYPES OF OPERATIONS

Operations for infantile paralysis are of two types: (1) operations undertaken primarily to correct deformity, thus putting the part in normal alignment and the muscles in a better position to use advantageously what power they have; operations of this type are manipulations, tenotomy, removal of bone, osteotomy, or the changing of the origin of a muscle to a different location; and (2) operations to increase function. either plastic operations on the tendons, or arthrodesis through increasing stability; operations of this type are tendon transference, the tenodeses, bony fusions, and bone block operations. In many cases a combination of the two types is employed.

PROCEDURES FOR THE CORRECTION OF DEFORMITY

Manipulations.—The old saying that the best way to cure a disease is to prevent it is most applicable in considering the deformities which are due to anterior poliomyelitis. Proper supervision will prevent practically all deformities. When they do exist to such an extent as to prevent or interfere with function, they should be corrected. Often this can be done by simple manipulation.

Deformities are caused by the overacting of the non-paralyzed muscles and by the action of gravity. The patient should be anesthetized and manipulation gently but firmly carried out. Adhesions must be broken gently, and the muscles

*From the Section on Orthopedic Surgery, Mayo Clinic, Rochester, Minnesota. Read before the Minnesota State Medical Association, Saint Paul, May 17 to 19, 1926.

stretched; the force should not be abrupt but steady, and characterized by regular partial relaxation, as tissue can be made to stretch more readily by such means. The part should be held in proper position after the correction, or the deformity will recur.

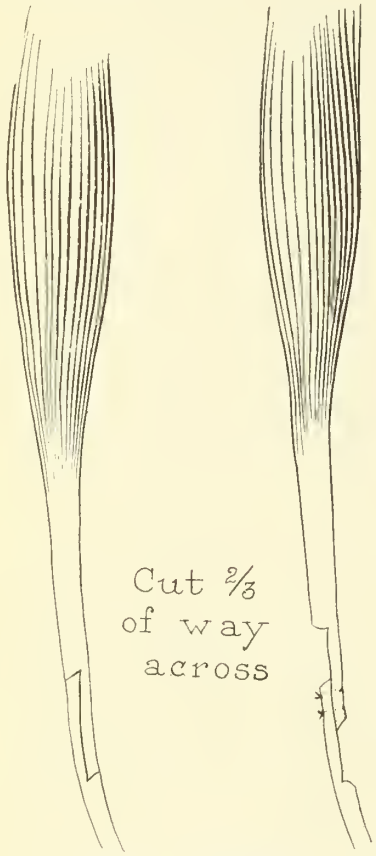


Fig. 1. Operation for lengthening of tendon.

Tenotomy.—Subcutaneous tenotomy is gradually giving way to the open type. The tendon Achilles is the best example and is lengthened by making two transverse incisions two-thirds across the tendon at different levels, and applying force so that the tendon ends will glide on each other and not gap (Fig. 1).

Stripping.—In certain situations a deformity is best corrected by stripping the muscle from the bone. Outstanding examples of this are the stripping of the os calcis in case of pes cavus deformity, and stripping the tensor fascia femoris from the iliac crest. The stripping of the os calcis, however, is not as successful in the markedly hollow foot, as might be expected. Usually bone must be removed in conjunction with it. Flexion deformity at the thigh is very often a serious handicap and a patient with severe deformity cannot stand erect enough to walk. The stripping operation in this region lengthens the affected muscles by transferring their origin to a lower level on the ilium; the operation in no way interferes with the nerve or blood supply of the muscle and thus the action is retained. Cutting directly across the muscle is prone to weaken it. In severe cases it may be necessary to dissect deeply onto the anterior portion of the capsule of the hip joint, cut this, and, in rare cases, divide the ilio-psoas muscle. The operations advised by Soutter and Campbell are identical in principle, but differ in that Campbell moves the muscle from its original bed along with a strip of bone to a lower level on the ilium, which is freshened so that the muscle will ankylose to it. He also cuts off the anterior superior spine with its attached muscle and moves it down (Fig. 2). The deformity may be of such degree

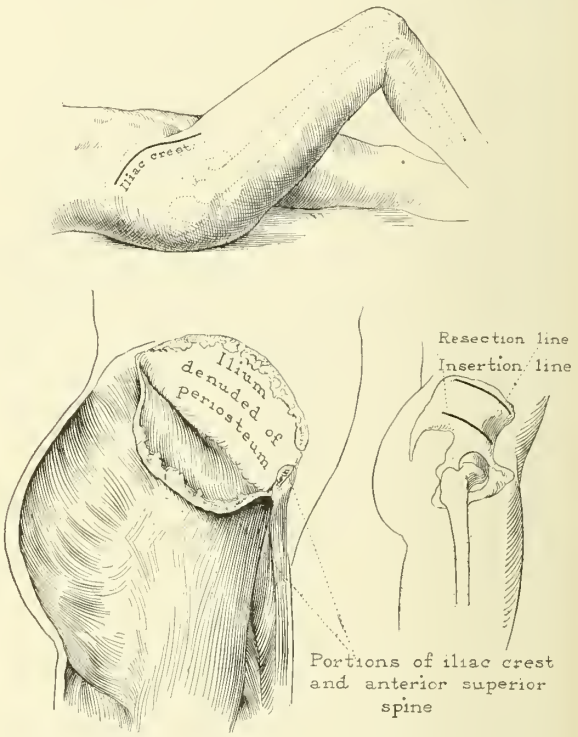


Fig. 2. Stripping of the ilium for flexion deformity.

that it can only be relieved by the removal of bone. This is true in long-standing talipes equino varus, and sufficient bone must be removed to permit of the correction of the deformity. There is not the necessity for removing as much bone as in cases of congenital talipes equino varus, for there is not the same tendency to recurrence in the acquired deformities.

Procedures to increase function.—Certain procedures are intended primarily to increase func-

tion, in those cases with no deformity, either by transferring tendons of non-paralyzed muscles to the insertion of paralyzed muscles, or by stabilizing procedures, the outstanding examples of which are the various operations on the foot and ankle. They are employed in suitable cases in which no deformity exists, or are used either at the same time as the procedures mentioned, or later, after the most has been gained by the altered and improved mechanics.

Tendon transference.—This operation is comparatively new in surgery, but we are now in a position properly to evaluate the method, for an enormous number of tendon transplantations and transferences have been done. The indications have become greatly narrowed, but this has raised the standard of the method until it is now used with greater confidence than in the early days. Steindler has done much to put the proper value on tendon work.

The strength of a muscle to be transferred should nearly approach that of the muscle which it is to substitute. This is all the more important when it is recognized that the altered mechanics consequent to the change of insertion often causes a loss of 50 per cent in the power of the muscle. All deformities should be corrected first, as the transferred tendon cannot be expected to correct a deformity. The tendon should be transferred under the proper tension and anchored in a proper manner. Much has been written recently on the technic of tendon transference. While this is important, it is not so important as whether or not the tendon to be transferred is strong enough to really help in the actual function. An example of tendon transplantation of the foot is the transference of the tibialis anticus to the outer side of the foot to replace the peroneus longus, or the transference of the peroneus longus to replace a paralyzed tibialis anticus. In the flail knee or in the knee with a tendency to buckle, if the hamstrings are good they can be swung forward, the biceps on the outer side and the semimenbranosus on the inner side, to the patella, thus taking at least part of the function of the quadriceps.

Stabilizing operations and arthrodesis.—Such operations may be undertaken on any of the joints. Under certain conditions arthrodesis may be performed on the hip or knee joint, but a patient will rarely elect this procedure, as most of them prefer to wear a brace unless their occupation is such that prolonged standing is necessary. Arthrodesis or stabilizing methods are replacing many of the tendon plastic operations on the foot. One of the chief operations, of the stabilizing type, is the Whitman astragalectomy, which consists of the removal of the astragalus along with posterior displacement of the foot. In suitable cases, particularly the calcaneal deformities, this gives an excellent foot with motion at the ankle and stability.

Instability of the foot is very disabling and the various arthrodesis operations such as those advised by Ryerson, Hoke, Steindler, and others, have a distinct advantage. The purpose of these operations is physiologic, namely, the restoration of stability. Such procedures also dispose definitely of existing and developing deformities and are examples of the combined types of operations mentioned. The physiologic function of any joint is stability and mobility. If stability is lost and mobility is retained, the joint, if a weight-bearing one, may be practically useless, but, on the other hand, if stability in good position is retained and mobility is lost, the joint may be extremely useful. In the foot the so-called triple arthrodesis, whereby an arthrodesis of the astragalus to the calcaneum, the calcaneum to the cuboid, and the astragalus to the scaphoid joint is obtained, will give real stability to the foot. In the shoulder when the deltoid is paralyzed marked disability follows the loss of power for abduction. The supraspinatus is not strong enough to abduct and the transference of the trapezius has not been successful. If the trapezius is powerful, excellent function is obtained by arthodesis of the head of the humerus to the glenoid fossa at an angle of 75° or 80° abduction, and forward about 70°. The mobility of the scapula on the trunk permits of a degree of motion for the whole arm that is greatly appreciated by those who have been deprived of the abducting power. The scolioses that rapidly become of the structural type following infantile paralysis have been especially difficult to treat and the results most unsatisfactory. Hibbs and his associates advocate securing the maximal correction by conservative measures followed by a fusion of the spinous processes and the laminæ thus maintaining the correction gained.

Bone block or check operations.—A block of bone may be placed in a situation so that a deformity may be prevented and the foot be kept in better position for function. Campbell's operation is a good example; a block of bone is placed

on top of the os calcis just posterior to the astragalus so that when the foot is dropped it will check against the tibia and thus prevent foot-drop (Fig. 3). The suspension method advocated by Gallie for foot-drop, wherein the paralyzed tendons of the tibialis anticus and peroneus longus are cut off and fastened to the tibia, has certain advantages, but the technical requirements of the operation are not as easily fulfilled as in the bone checking operations.

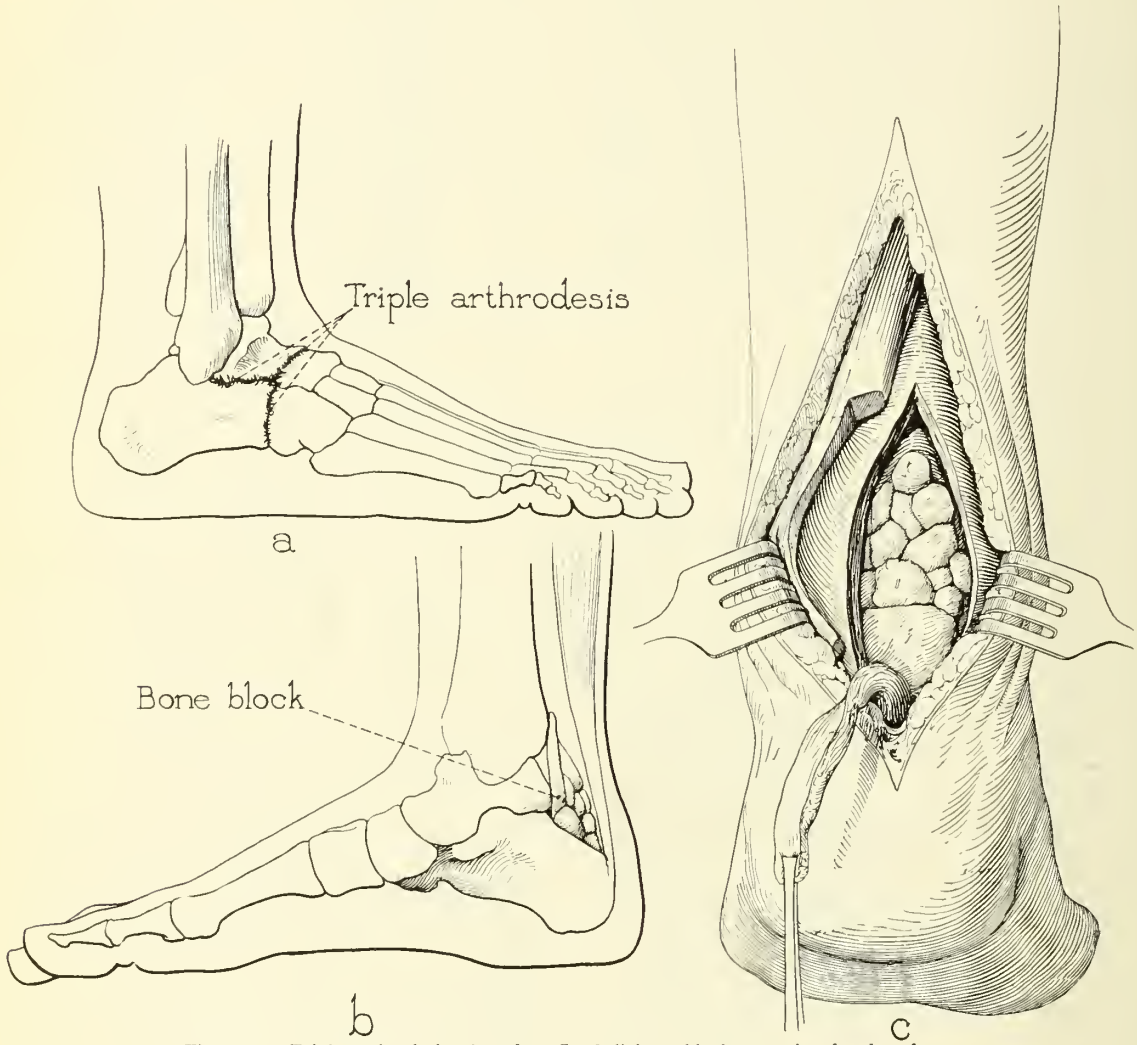


Fig. 3. *a*, Triple arthrodesis; *b* and *c*, Cambell bone block operation for drop-foot.

CONCLUSIONS

1. Each case of infantile paralysis demands careful consideration, for the operative methods are applicable to only a comparatively few of the total number of cases. The operation must be suitable for the patient and the disability, and the time for the operation must be carefully considered. The surgeon should be certain that all possible improvement has been obtained by conservative measures.

2. The operations are of two types: (1) those performed primarily to correct deformities, such as manipulation, tenotomy, and stripping operations; and (2) operations to improve function, the deformity having been corrected, such as tendon transference, stabilization, or arthrodesis. Combinations of the two types are exemplified in arthrodesis and the stabilizing types of operations.

3. Many operative procedures have been devised and applied to many patients, but most of these operations have been discarded. Many

times multiple operations are necessary to bring about satisfactory improvement.

BIBLIOGRAPHY

1. Campbell, W. C.: Transference of the crest of the ilium for flexion contracture of the hip. South. Med. Jour., 1923, xvi, 289-292.
2. Campbell, W. C.: An operation for the correction of "drop-foot." Jour. Bone and Joint Surg., 1923, xxi, 815-825.
3. Hoke, Michael: An operation for stabilizing paralytic feet. Am. Jour. Orthop. Surg., 1921, xix, 494-507.
4. Lovett, R. W.: The operative treatment of infantile paralysis. Surg., Gynec. and Obst., 1921, xxxii, 20-30.
5. Ryerson, E. W.: Arthrodesing operations on the feet. Jour. Bone and Joint Surg., 1923, xxi, 453-471.
6. Soutter, R.: A new operation for hip contractures in poliomyelitis. Boston Med. and Surg. Jour., 1914, clxx, 380-381.
7. Steindler, Arthur: Operative treatment of pes cavus; stripping of the os calcis. Surg., Gynec. and Obst., 1917, xxiv, 612-615.
8. Steindler, Arthur: The treatment of the flail ankle; pan-astragaloid arthrodesis. Jour. Bone and Joint Surg., 1923, xxi, 284-294.
9. Whitman, A.: Astragalectomy and backward displacement of the foot; an investigation of its practical results. Jour. Bone and Joint Surg., 1922, xx, 266-278.

UNIVERSAL BAN ON HEROIN

The Interparliamentary Union will be called on at its meeting in 1927 to determine whether a universal ban shall or shall not be placed on diacetylmorphine (heroin), if a resolution adopted at a recent conference in Geneva is effective. The resolution was adopted on the initiative of Stephen G. Porter, chairman of the Committee on Foreign Affairs of the U. S. House of Representatives, one of the U. S. delegates to the conference. Mr. Porter cited the action of the House of Delegates of the A. M. A., in 1920, recommending that heroin be eliminated from all medicinal preparations and that its manufacture and sale in the U. S. be prohibited. Mr. Porter is convinced that at least one third, or one-half, of the crimes of violence committed in the large cities of the U. S. by the so-called gunmen and others are committed by heroin addicts. (Jour. A. M. A., Sept. 18, 1926, p. 944.)

THE STANDARDIZATION OF INSULIN

Several international conferences in relation to the standardization of insulin have been convened by the health organization of the League of Nations. At the last conference approved methods of bio-assay for insulin were adopted, and the unit as provisionally defined by the Insulin Committee of the University of Toronto was accepted. (Jour. A. M. A., Sept. 25, 1926, p. 1040.)

MECHANICAL TREATMENT OF ANTERIOR POLIOMYELITIS*

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The treatment of anterior poliomyelitis easily divides itself into three distinct stages: (1) the acute stage, from the time of onset until the neuritis and myositis disappear (the time may be days or months); (2) the improving stage, beginning when neuritis and myositis have disappeared and remaining at least two years; (3) the surgical stage, beginning at least two years after the acute attack.

The mechanical treatment is not confined entirely to any one stage of treatment of poliomyelitis, as mechanical apparatus is used in the acute stage, the improving stage and the surgical stage. This paper has as its object a brief description of the types of treatment used, especially in the improving stage, which includes the use of apparatus, physiotherapy, extra warmth, exercises, etc.

We are quite universally agreed upon general measures of rest, extra warmth, light feeding and general symptomatic treatment in the acute stage. Spinal drainage has proved most valuable and, according to some authors, serum is of certain value.

The pathology of the condition is a hemorrhagic myelitis of the cord and inflammatory changes of the meninges and resulting edema in the cord and its coverings. This is the broad working basis and the treatment in the acute stage must be based upon the pathology.[1]

In the acute stage, after the fever has subsided, we usually find our patient paralyzed in one or more limbs, which are usually tender to touch, painful upon motion and the patient's general condition somewhat below par. It is our opinion that the principle of treatment should be rest and protection until all signs of tenderness upon pressure or motion have disappeared. Various types of apparatus are used in the acute stage, such as splints, fracture-box, sandbags, braces, plaster dressings, with the object of giving rest and preventing motion and deformity. Extra warm clothing, external heat, cotton or wool pads are aids in protecting the limbs and giving comfort. Absolute rest in bed should be

*Read before the Minnesota State Medical Association, Saint Paul, May 17-19, 1926.

the rule with the feet at right angles, the legs straight, upper extremities at rest and the patient flat in bed until motion and light massage are no longer painful. This may be only a few days in some cases; in others, many months.

At the end of the acute stage, that is when tenderness and painful motion have disappeared, a full and complete test should be made, of damage done, a complete muscle test should be given and the amount of damage to each muscle or group of muscles ascertained and a record kept. The method of Lovett[2] is most valuable. This includes examination of every available muscle group of arms, legs, back, neck and abdomen. The degree of existing power in the muscles is classified as follows: (1) normal; (2) good, when the muscle performs full function and takes some resistance; (3) fair, when the whole arc of motion is performed but very little resistance is required to overcome the movement; (4) poor, when there is some motion but when complete motion cannot be accomplished against gravity; (5) trace, when there is muscular contraction but no motion in response to voluntary effort; (6) gone, when there is no response in the muscle to voluntary contraction. A record should be kept of the various groups of muscles and tests should be taken at least twice each year for record as to improvement.

If average mechanical judgment has been used the patient will reach the convalescent improving stage without deformity. If deformity is present when the improving stage is reached, it should be corrected gently and suitable apparatus advised. If the paralysis has damaged only a few or small group of muscles, the patient may be up and about with apparatus; if the paralysis involves many groups of muscles, weight bearing, I feel, should be denied for a longer period and the very best results in our experience have come to the patient who has remained in bed at least a year after the acute stage. Some may be able to take exercises without weight bearing in swimming tanks or on horseback. The general condition of the child should not be overlooked in the improving stage because many are anemic, badly nourished and are in a poor way to undergo even simple types of treatment used in the improving stage.

Apparatus.—The treatment of the improving stage includes the use of apparatus (bracing and walking apparatus). The object of the apparatus is to give stability to the extremities and the spine so that the patient may walk and move about. Braces also prevent deformity and muscle strain, help the patient to exercise the strong and well muscles and aid in improving circulation, muscle tone and the return of the limbs to normal. Sleeping apparatus is used to keep the feet at right angles, the knees in normal position, keep the spine straight and, also, the upper extremities in proper position and is as necessary as the walking apparatus used in the daytime. It is desirable that the apparatus should be (1) simple, (2) easily applied and accomplish the results required, (3) comfortable, light of weight and if possible of good appearance.

Apparatus should be ordered by the physician and applied by him rather than by the instrument maker, who has little knowledge of the existing disability and the real requirements of the apparatus. Many instrument makers are willing to coöperate to the good of the patient and their advice often results in a simpler and better type of apparatus.

Muscle training.—Muscle training consists in performing certain motions with the muscles and parts affected, asking the patient to use all the muscle power he has in performing and aiding this motion. If many groups of muscles are affected, the assistance of one trained in a special field of physiotherapy is quite necessary. If only a group or two of muscles are involved, the mother or nurse properly instructed may carry on with fair success. The exercise should be only a few manipulations repeated several times daily if possible. Long-continued and infrequent exercise is perhaps more harmful than none at all. A muscle receives its nerve supply through more than one spinal center and it is the object of muscle training to exercise the damaged nerve centers and tracks as well as the muscles. It is quite apparent that muscle training is of no value when there is complete loss of nerve enervation.

Massage.—Massage undoubtedly increases the blood and lymph supply, carries heat to the tissues, improves muscle tone and may assist in the prevention of deformity. If many groups of muscles are involved, one specially trained in massage is necessary to give proper treatment. Again, the nurse or mother can be of great aid in the simple case, remembering that massage should not be prolonged but should be of short

duration and given frequently. It is my opnion that massage gives greatest benefit by aiding circulation, improving the muscle tone and improving the temperature of the affected part. Long-continued massage is harmful and the effect of massage in the cure of a case has been, I believe, grossly exaggerated.

Extra warmth.—In the improving stage we find the temperature of the limb much below normal. Extra clothing, wool clothing, hot baths, radiant heat through electric lamps are of great importance in keeping up muscle tone and preventing atrophy and damage to the parts in cold weather.

The ideal case should spend many months in bed receiving extra warmth, massage and graduated exercises through muscle training until muscle strength is sufficient to permit weight bearing. In the improving stage exercises without weight bearing are of great value. Swimming in brine tanks or even exercises taken in the common bathtub without weight bearing are of great value. Horseback riding, moving about in apparatus or exercises obtained without weight bearing are of great value.

Electricity.—Electricity, perhaps, if properly given by one trained in localizing the nodal points of the muscles affected, may be of some value. It is our opinion that the value of electricity is similar to exercise, producing contractions in muscles not possible to exercise by other means. There is much apparatus on the market at the present day but in our own practice we seldom use electricity. I believe it has been overrated and damage is actually done by its long continued use or when employed in untrained hands.

End-results.—If apparatus, muscle training, rest, massage, extra warmth have been conscientiously used, we can expect, I believe, certain definite results expressed approximately in the following percentages:

PERCENTAGE OF GAIN IN THREE YEARS[2]

Arm	Full Recovery	Partial Recovery	No Recovery
Upper extremities:			
Wrist extensors	68%	12%	20%
Wrist flexors	63%	9%	28%
Trapezius	61%	22%	17%
Pectoralis major	59%	21%	20%
Biceps	59%	25%	16%
Triceps	59%	20%	21%
Posterior deltoid	56%	22%	22%
Anterior deltoid	53%	29%	18%
Trunk			
Abdomen	30%	19%	51%
Back	78%	17%	5%
Neck	90%	8%	2%
Lower extremities:			
Leg			
Gluteus maximus	34%	26%	40%
Peroneals	32%	28%	40%
Hip flexors	30%	33%	37%
Hamstrings	24%	49%	27%
Gastrocnemius	22%	40%	38%
Hip abductors	21%	34%	45%
Quadriceps	21%	42%	37%
Posterior tibials	14%	28%	58%
Anterior tibials	12%	36%	52%

REFERENCES

1. Chatterton, C. C.: Mechanical and surgical treatment of talipes due to anterior poliomyelitis. St. Paul Med. Jour., 18, 304-307, Oct., 1916.
2. Lovett, R.: The third year in infantile paralysis. Jour. Am. Med. Assn., 77, 1941, 1921.

EPHEDRINE

The Council on Pharmacy and Chemistry publishes a report on ephedrine. Ephedrine is an alkaloid first obtained in 1887. Chemically, it is closely related to epinephrine. Ephedrine hydrochloride and ephedrine sulphate are soluble in water. Ephedrine is claimed to produce effects similar to epinephrine. Its most important effects thus far reported consist in a rather lasting rise of blood pressure on intravenous or intramuscular injection. Clinically, promising results have been reported from the use of ephedrine, especially in asthma and for shrinking the turbinated bodies. The clinical trials which have been reported in this country have been carried out with ephedrine sulphate made in the Peking Union Medical College. The Council is informed that the Abbott Laboratories will shortly be in a position to supply a salt of ephedrine obtained from this source. Burroughs, Wellcome & Co., London, supply ephedrine hydrochloride for experimental purposes and have supplied the Council with a specimen of the product and the tests and standards used for its control. Eli Lilly & Co. has announced that it is marketing ephedrine sulphate, containing a small amount of pseudo-ephedrine, under the name "Fedrin." The Council is considering the question of recognizing the proprietary name for this product, and the evidence for its value and control. The A. M. A. Chemical Laboratory has taken up the establishment of standards for ephedrine hydrochloride and ephedrine sulphate. The Council has postponed the acceptance of ephedrine or its salts for New and Non-official Remedies to await confirmatory clinical evidence, and until acceptable brands of the drug are available. (Jour. A. M. A., Sept. 11, 1926, p. 849.)

CARDIOVASCULAR RENAL DISEASE IN RELATION TO SURGERY*

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The safety of surgical procedures is largely dependent on the cardiovascular-renal reserve. Age, sex, stature, state of nutrition, and occupation, are vital factors which exert a profound influence on the amount of reserve in the circulatory system and renal excretory structure. Youth possesses a more resilient circulatory system than age and consequently a greater cardiovascular reserve. While the sex incidence of organic cardiac disease is approximately equal, the life expectancy of women with cardiac disease is greater than that of men, for women, as a group, are subject to lesser occupational stress, and are not called on to deplete so rapidly their cardiac reserve. Patients whose daily occupational routine subjects them to strenuous physical strain and stress, have a life expectancy which is not comparable, as a rule, to that of patients with lighter duties to perform.

Clinical observation has contributed much to the knowledge of cardiovascular renal disease. However, not until recent years, through the epoch-making advances in the medical sciences, have means and methods been available for estimating the efficiency of the circulatory system and renal excretory mechanism, and for measuring to a fair degree the cardiovascular renal reserve. The phenolsulphonephthalein test of Rowntree and Geraghty, the first trustworthy method of estimating renal function, has withstood the test of time and repeated application, as has the estimation of the urea and creatinin content of the blood. These methods are invaluable not only in the estimation of renal function, but in affording a means of relative prognosis so far as renal excretory function is concerned.

In recent years electrographic studies have enlarged our knowledge of the effect of cardiovascular disease on the efficiency of the circulatory system, and have also afforded a means of relative prognosis. It is not to be inferred that these methods supplant clinical study and observation, but rather that they enhance the value of such observations when used in conjunction with them. Together they increase the degree of certainty with which one may foretell the additional burden that these vital organs may withstand.

The relation of cardiovascular renal disease to surgery is constantly changing, not only as a result of advances in the medical sciences, but through improvement and refinement of surgical methods fostered by the desire to improve results and decrease the mortality rate. It was only through the acceptance and application of the principles and teachings of Lister that intra-abdominal, intra-thoracic, and intra-cranial surgery became possible and has progressed. Lister presented the first important factor of safety in the conduct of surgical procedures, and surgery has progressed, results have improved and the mortality rate has been reduced as the result of refinements of methods, better selection of patients, and the introduction of additional factors of safety.

In the past, in a fair proportion of the cases that comprise surgical mortality, death has been due to cardiovascular renal disease; and experience has taught that, barring the circulatory lethal accidents of coronary sclerosis and thrombosis and pulmonary embolism, death is often preventable when the surgical procedures are conducted within the circulatory and renal reserve.

Causes of death following surgical procedures may be divided into three groups: (1) preëxisting and coëxisting organic disease; (2) surgical accidents, and (3) infection. For the most part, Group 1 comprises renal insufficiency and cardiovascular disease. The most common causes of death in Group 2 are, hemorrhage, shock, and effects of anesthetics. Group 3 contains a wide range of infections, many of which are most prone to occur in debilitated patients, particularly when the cardiovascular renal reserve is depleted by extensive surgical procedures; most of them may be eliminated, however, by directing attention to the causes of death in Groups 1 and 2. Prolonged surgical procedures and long general anesthesia rapidly deplete even normal cardiovascular reserve. The depressant effect of general anesthetics, particularly ether, on the kidney, has long been recognized and has given way largely to the use of local and regional anesthesia for operations in the presence of renal disease. That prolonged general anesthesia increases the stress upon the

*From the Division of Surgery, Mayo Clinic, Rochester, Minnesota. Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 17 to 19, 1926.

cardiovascular system is beyond question. Lundy has recently shown by experimental and clinical investigation the immediate deleterious effect upon the circulatory system of prolonged and repeated cyanosis during anesthesia, and concludes that the cardiac reserve is rapidly jeopardized by it.

The divided or multiple-step operation is applicable to many surgical procedures and affords a means of minimizing the burden of surgical treatment in the presence of low cardiovascular renal reserve.

Metabolic studies have clarified our knowledge of the effect of disturbance of internal glandular structures and have established the present-day methods of rehabilitation of surgical patients. Plummer's recent contribution regarding the administration of Lugol's solution to patients with exophthalmic goiter has practically eliminated disturbances of the cardiovascular system as a cause of death following thyroidectomy.

The discovery of insulin and its use in the treatment of diabetes has eliminated the effect of diabetes on mortality rate. Rowntree and Keith have shown that the average patient with nephritis may be operated on with safety after adequate preparation, the application of surgical factors of safety, the use of local, regional, or combined anesthesia, and with the divided or step operation.

Perhaps no group of patients presents the problem of cardiovascular renal disease in relation to surgery so vividly as those suffering from prostatic obstruction. Ninety-five per cent of these patients are more than fifty years of age; 75 per cent are between sixty and seventy-five years of age. Prostatic hypertrophy occurs at an age later in life than the usual surgical diseases, and the degenerative changes in the cardiovascular system incident to that age require consideration.

Willius, in a recent study from the cardiovascular standpoint, including electrocardiographic investigation of 705 patients with prostatic hypertrophy, noted the presence of cardiovascular disease in 42 per cent. Arteriosclerotic cardiac disease occurred most frequently. Forty-three per cent presented this type, and 36 per cent the arteriosclerotic type associated with hypertension. Hypertensive cardiac disease occurred in 17 per cent, unassociated with outstanding arteriosclerotic features. Miscellaneous types of cardiac disease occurred in 4 per cent of the cases and included rheumatic endocarditis, with stenosis or incompetence of the mitral or aortic valves, myocarditis, and pericarditis. In 8 per cent of the cases angina pectoris was present. Willius further concludes that the incidence of cardiovascular disease is higher with prostatic obstruction than with many other diseases during similar decades, indicating that coëxisting cardiovascular disease is increased by persistent urinary retention.

In a recent review I noted that in 75 per cent of patients with surgical benign prostatic obstruction the residual urine varied from 60 c.c. to the capacity of the bladder, and that the resultant renal insufficiency varied from slight retention to over 200 mg. of urea for each 100 c.c. of blood, when uremia was present at the time of admission. The improvement of the cardiovascular reserve coincident with improvement of renal function following gradual decompression of the bladder and prolonged urethral or suprapubic drainage is noteworthy in conjunction with Willius' observation of the incidence of cardiac disease in cases of prostatic hypertrophy. I have observed numerous patients of this type, in uremic states and near a cardiac break, return to a fair state of cardiovascular renal reserve so that they have been operated on safely and successfully. During 1925 at the Mayo Clinic prostatectomy was performed in 255 cases with only six deaths, a mortality rate of 2.3 per cent. In only one was death due to cardiac disease.

So far as the heart is concerned, our experience leads me to state that the ordinary valvular lesions that are fully compensated present no unusual surgical hazard. In the presence of the acute or subacute endocardial valvular infections. however, only most urgent surgical operations should be considered. Likewise, congenital lesions of the heart add a distinct hazard to major surgical procedures. The consideration of operation in the presence of the degenerative cardiac diseases must be individualized and based entirely on the prognosis of the particular type of disease, as ascertained by clinical and electrocardiographic studies, considered in conjunction with the urgency of the operation and the effect on the cardiovascular system of removal of the surgical burden. It should be emphasized that prostatic obstruction, large pelvic and abdominal tumors, and so forth, may act as a burden to the

circulatory system, and improvement follow immediately after operation.

Essential hypertension in the presence of good cardiac and renal function is no contraindication to surgical operations.

So far as renal disease is concerned, surgical procedures may be successfully carried out in the presence of marked renal damage. The renal functional tests may be utilized as excellent guides to the risk in the presence of renal insufficiency. It may be stated, however, that except under most unusual conditions operation should not be contemplated if the urea content of the blood is above 100 mg. for each 100 c.c., or the phenolsulphonephthalein return is less than 15 per cent.

At times patients are encountered in whom severe cardiovascular or renal complications occur postoperatively although there have been no preoperative manifestations of such organic disease. These, however, usually recover. Barrier and Keith have reported four cases of acute renal insufficiency following major operation. However, postoperative cardiovascular renal complications are usually acute exacerbations of previous coëxisting disease and usually abate.

The operability of patients with severe cardiovascular renal disease is not generally appreciated; nor is the scope of surgical treatment of such patients realized. When they are operated on under certain conditions the mortality rate may be surprisingly low. In many cases the chronic cardiovascular renal disease is determined by a fixed pathologic condition, and may be benefited only by the removal of coincident burdens, such as reduction of weight, removal of foci of infection, and adjustment of habits. On the other hand, it is often an acute exacerbation produced by surgical conditions amenable to operative treatment, without great hazard, if adequate preoperative preparation is instituted. It is essential that a patient suffering from severe cardiovascular or renal disease should receive careful preparation for surgical treatment. Such a patient is never suitable for routine surgical treatment; however, judicious preoperative preparation, followed by the divided or multiple-step operation under local or combined anesthesia, usually results in uneventful convalescence.

With no intention of minimizing the importance of cardiovascular renal disease, but fully aware of the potential hazards, I believe that present methods of determining cardiovascular and renal efficiency and determining reserve, together with the adequate methods of preoperative treatment, afford opportunity for surgical relief of many coëxisting and exacerbating conditions with a surprisingly low mortality rate, heretofore not appreciated.

WHAT PRICE FREE HOSPITALIZATION?

Minneapolis has a General Hospital for the resident needy of the City. Hennepin County has a tuberculosis sanitarium for the rest of its needy tuberculosis patients of the County. The State University likewise operates a hospital, accessible to all residents of the state who may be deemed entitled to treatment therein. Theoretically only those who by reason of the financial condition of themselves or family are unable to pay for private medical care and attendance, are to be admitted to these institutions. As far as the University General Hospital is concerned, however, and having special reference to the condition of affairs existing in Hennepin County, it seems that this theory is far from being recognized in actual practice.

Under a law passed in 1921 the several counties of the state could send needy patients to the State University Hospital upon certification of the Judge of Probate that the applicant was entitled to free treatment, expense of which is borne equally by the county and state. Under this act, for the fiscal year ending June 30, 1923, the cost to Hennepin County for its half was $459.97.

In 1923, however, the law was so amended as to give to the County Commissioners of each county, individually, the right of certifying applicants to this hospital. By a peculiar coincidence the change in the law was accompanied by a decided change in the financial condition of the residents of Hennepin County, for the first fiscal year wherein the certification was made by the County Commissioners of Hennepin County, ending June 30, 1924, the cost to the county for its half had jumped to $3,135.52; to $16,758.28 for the year ending June 30, 1925; and to $32,687.90 for the year ending June 30, 1926.

That this change in the law did not similarly affect the financial condition of the residents of other counties in the state is shown by the fact that Ramsey County's one-half for the fiscal year ending June 30, 1924, was only $556.37, for the fiscal year ending June 30, 1925, was only $356.03, and that for the fiscal year ending June 30, 1926, their one-half had dropped again to only $104.60.

In other words, where the one-half paid by the 86 counties of the state for the fiscal year ending June 30, 1926, amounted to $83,933.00, Hennepin County's share amounted to 38.9 per cent of that total, while Ramsey County's expense represented only 6/100 of 1 per cent of the cost to all counties.—*The Taxpayer*, Aug. 15, 1926.

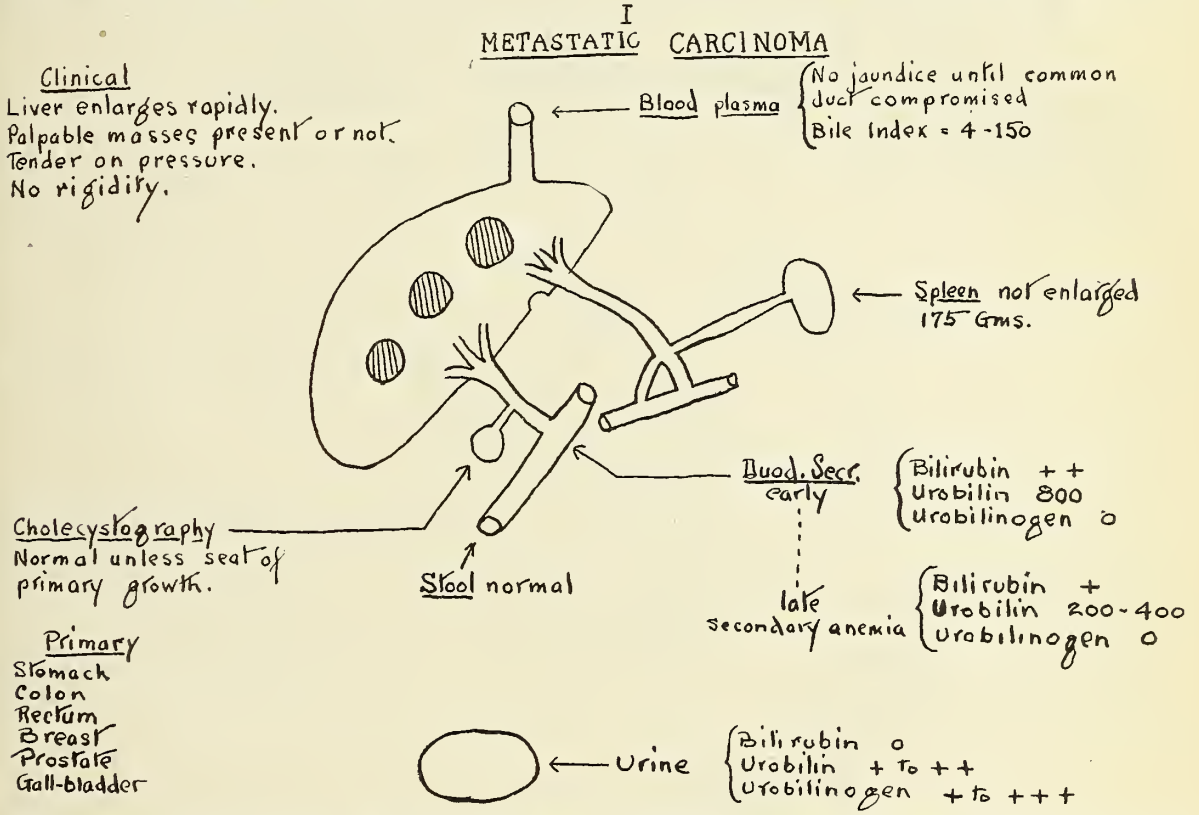
THE CLINICAL APPLICATION OF THE NEWER KNOWLEDGE OF THE BILIARY FUNCTION*

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As early as 1914, while working with Eppinger, I convinced myself of the correctness of F. Mueller's theory as regards the fundamental importance of bilirubin excretion by the liver: that unless bilirubin is allowed to flow into the bowel where bacteria can reduce it at least in part into urobilin the urobilin will disappear from both the bile and urine and not reappear regardless of how badly damaged the liver becomes or how much blood is destroyed and thrown upon the liver by chemical agents.

Since then a great deal of contention for and against this hypothesis has been indulged in. Thanks to the work particularly of Rous and McMaster of the Rockefeller Institute and Mann of Rochester the hypothesis now can be regarded as converted into an established fact. The fact which misled many observers was that if the reducing organisms, normally present in the bowel only, ascended into the common duct and its hepatic radicles and then the common duct was tied or the excretion obtained by duodenal tube, urobilin would be formed. This state of affairs, as shown by McMaster, was the constant error in the common methods of animal bile fistula work. Rous' work with methods obviating this infection gave the first clarity to the experimental data.

A second fact which now can be regarded as established with reference to the relation of bilirubin and hemoglobin is that as Rous[1] says "under normal circumstances the variations in the



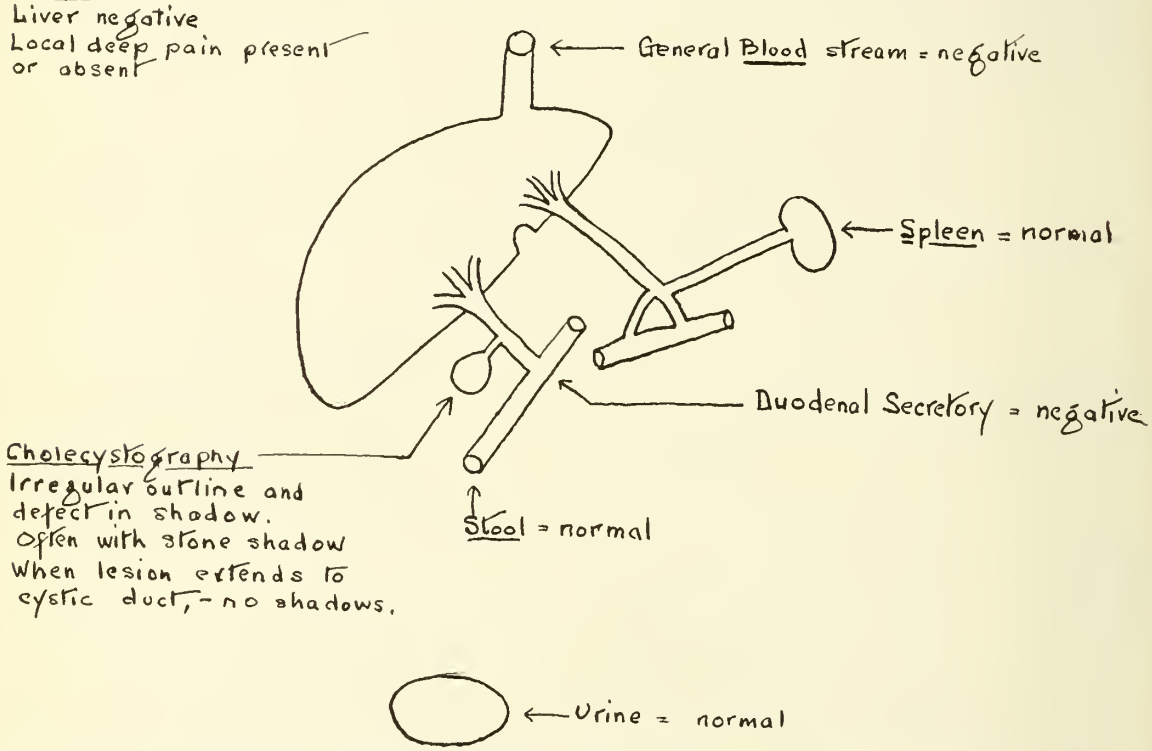
While metastatic carcinoma of the liver is by far the most common discrete lesion of the liver, the values indicated hold equally well for gumma, cyst ecchinoccic or congenital, sarcoma and simple tumors. Abscess of the liver unless well walled off will give because of the outspreading hepatitis much more functional disturbance and higher bilirubin values in the blood and urine. A stone or new growth obstructing any one of the main divisions of the hepatic duct causes complete atrophy of the tributary portion of the liver without producing symptoms and with only transitory urobilin in urine. The bile index is not permanently raised to fifty or over unless the growth is compromising the common duct at the hilus of the liver. Values of 150 occur only when there is complete common duct obstruction. Values of 50 to 100 occur when two-thirds or more of the liver is involved in the growth and the growth is progressing rapidly.

*From the Medical Division, Nicollet Clinic, Minneapolis. Read before the Interurban Academy of Medicine, Superior, Wisconsin, March, 1926, and The Minnesota Pathological Society, April, 1926.

amount of hemoglobin circulating as blood from day to day find a direct, if not entirely accurate, expression in the amount of bilirubin discharged into the bile. The corpuscular wastage would seem to be recovered almost immediately in terms of bilirubin, the greater the number of cell deaths the more the bilirubin put out." In 1916 I[2] postulated this fact from my blood and duodenal quantitative pigment studies. In 1917 I[3, 4] was sufficiently certain of my ground to venture to express this relation by a simple formula which I called the hemopoietic-hemolytic index or H-H for short. In 1920 I[5] found that I could produce increased bile pigments in healthy students by taking advantage of the hemolytic action of quinine salts. At that time I suggested to my former student and co-worker, Dr. Platou, that malaria could be diagnosed quite readily by direct pigment estimations as by finding the parasites in the blood. He had an excellent opportunity to make these observations and reported his work in an eastern journal.[6] It is gratifying to find in the course of ten years that the concept is now an accepted fact and can be built on without reservation. In 1920 Rous and Oliver's work was editorially commented on in the Journal of the American Medical Association in these sentences, "The diagnosis of disease like pernicious anemia and hemochromatosis has sometimes been extremely difficult unless a conspicuous siderosis of the skin has developed. Necropsy usually reveals far more siderosis in the internal organs, but it cannot be detected during life." I answered this by studies in seventeen patients dying of pernicious anemia in which detailed studies of the hemosiderosis in spleen, liver, pancreas and kidney were done in whom during life duodenal pigment studies predicated post-mortem findings. I said that icterus was a relatively late phenomena and that long before the sclera and skin registered the pigment the blood bed was flooded with bilirubin. In

II

PRIMARY CARCINOMA OF GALLBLADDER



Prior to the advent of cholecystography the finding at operation of an uncomplicated primary carcinoma of the gallbladder was purely accidental and fortuitous. The diagnosis was stone. With cholecystography it is possible to make a pre-operative diagnosis provided the cystic duct is free and no complicating cholecystitis is at the time of the examination making the gallbladder so irritable that the dye will not enter. The help in differential diagnosis is desirable, for many elderly patients with chronic cholecystitis, stone and pericholecystitis often with bulky adhesions are wrongfully so strongly suspected of having malignancy that they are only too frequently not given the benefit of operative interference.

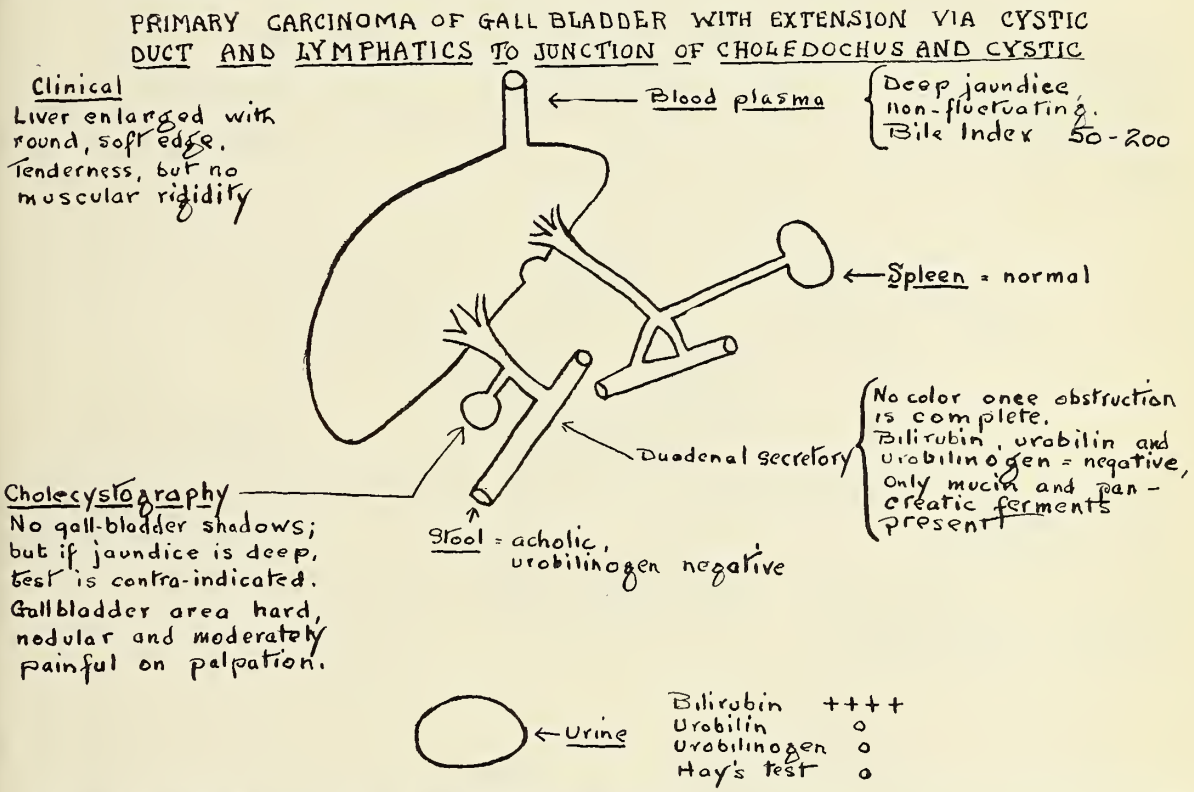
1925 Rous now says: "Tissue icterus is in point of fact only the imperfect secondary expression of a condition primarily confined to the blood pool."

Thanks particularly to the work of Mann and his associates we are now prepared to believe that the conversion of hemoglobin into bilirubin occurs in the territory of the reticulo-endothelial system as a whole with the emphasis upon the marrow, spleen, lymph glands, and the Kupffer cell areas of the liver. The liver then as a whole, in relation to this function, is to be regarded as an excretory organ and not primarily a manufacturing one. This discovery immediately clarified a fact which mystified me for ten years, to-wit: why does the blood bed contain in the hemolytic diseases so much bilirubin and not urobilin? It does because the bilirubin is on its way to the liver and not on its way to the kidney as I had always supposed.

The establishment of the further fact that bilirubin, for the liver as well as the kidney, in man is a threshold substance and its threshold many times higher than urobilin, serves to make the mystery clear. Bilirubin cannot escape via the kidney for the dam there is higher than at the liver portal: urobilin does not accumulate in the blood pool because it can with ease slide out at the kidney door.

For ten years I have played with these pigments as they occur in the duodenal secretion, in the urine and blood plasma. With the advent of this newer knowledge it occurred to me that it might be profitable to consider liver function from the angle of this physiologic pigment—for at least then one is certain of what particular function of the liver he is attempting to evaluate.

III



Carcinoma invading the juncture of the cystic and common duct is usually attended with a painless deep non-fluctuating jaundice. A stone in the common duct may also be painless but off and on bile escapes by the stone, which is the most important differential diagnostic point.

To measure total liver function is quite another matter when we stop to enumerate for instance a few of its relatively well known functions to wit:

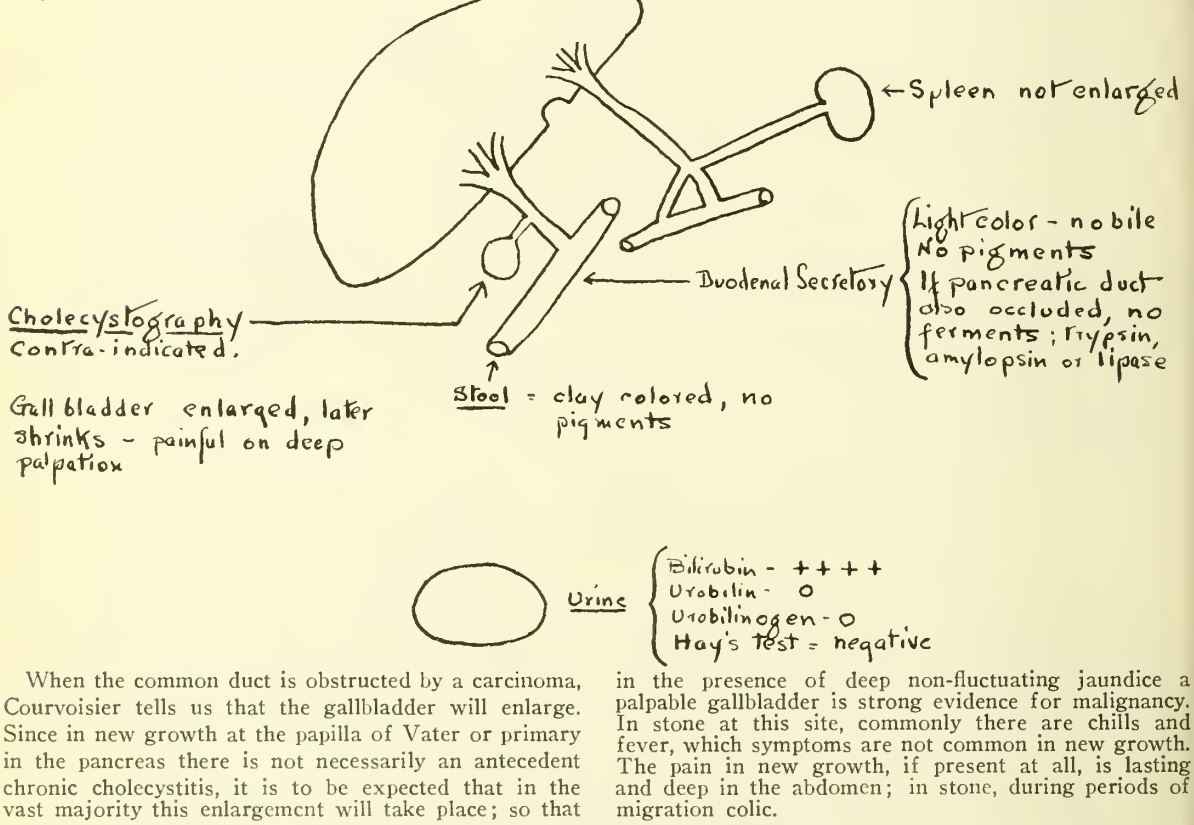
1. Stores glycogen.
2. Converts protein products absorbed from the bowel into urea.
3. Detoxifies poisons; fixes and renders harmless bacteria and foreign proteins.
4. Metabolizes bile salts.
5. Excretes cholesterol and calcium.

6. Excretes bile pigments, after partaking in their metabolism.

1. The sugar storage and release function of the liver involves too many other organs and tissues to be promising as a liver function test. The liver regulates the content of glucose in the blood, but the pancreas and other tissues have to do with its utilization. Mann has shown that the body can utilize levulose without the presence of the liver. I therefore mention the levulose and fructose liver function tests to dismiss them.

IV

PRIMARY CARCINOMA OF PANCREAS OR PAPILLA OF VATER



When the common duct is obstructed by a carcinoma, Courvoisier tells us that the gallbladder will enlarge. Since in new growth at the papilla of Vater or primary in the pancreas there is not necessarily an antecedent chronic cholecystitis, it is to be expected that in the vast majority this enlargement will take place; so that in the presence of deep non-fluctuating jaundice a palpable gallbladder is strong evidence for malignancy. In stone at this site, commonly there are chills and fever, which symptoms are not common in new growth. The pain in new growth, if present at all, is lasting and deep in the abdomen; in stone, during periods of migration colic.

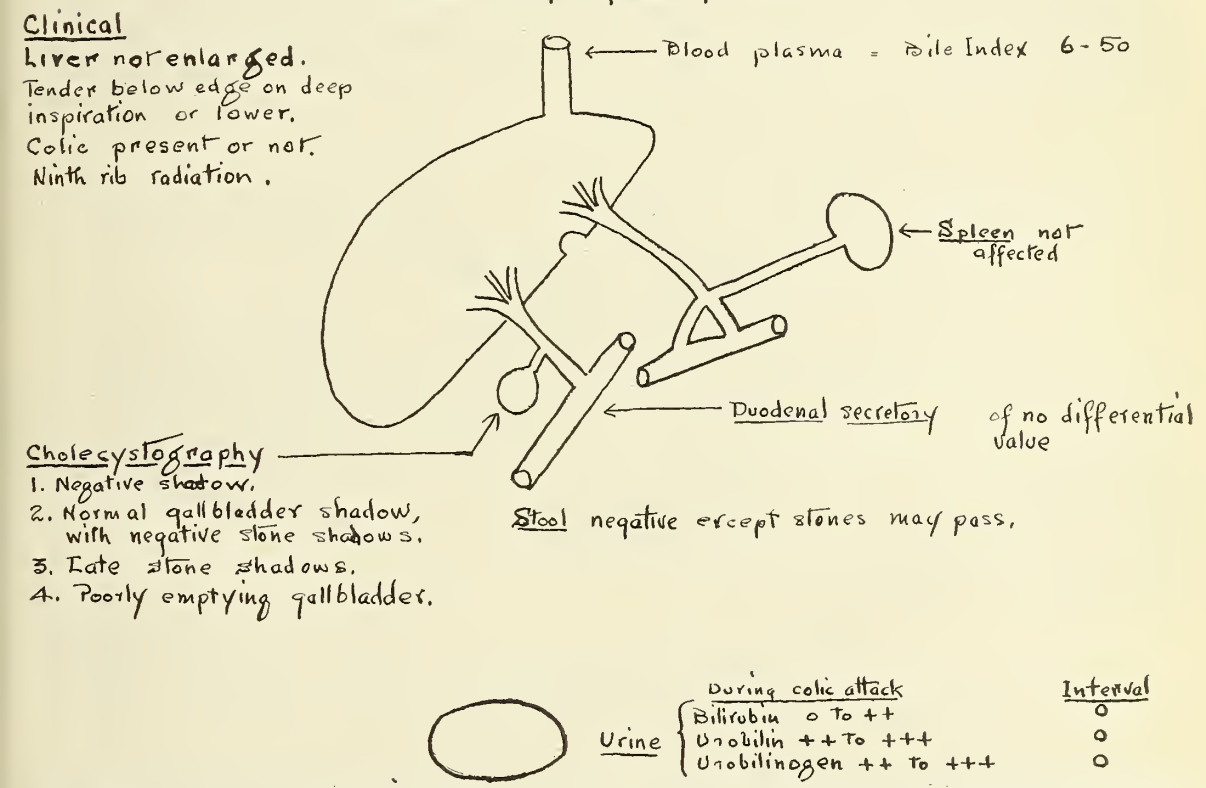
2. Of the part played in urea production by the liver we lack sufficient knowledge at various points in the cycle to feel other than that again here other organs and tissues play a not inconsiderable part.
3. The detoxifying function of the liver is being very intensively studied at present and in the field alone of immunity there is much understanding appearing, but as yet not many fixed facts.
4. The bile salts (sodium taurocolate and soda glycolate) are specifically synthesized in the liver and are the pace-makers of the bile-secreting function of the liver. That much is established. When they are withdrawn to the outside as in bile-fistula work the total bile secretion of the liver drops often to one-third. In duodenal bile studies the bile acids can be tested for, qualitatively, but there has appeared no reliable quantitative method. McClure[7] uses a colorimetric test not as yet accepted by other workers.
5. Cholesterol has a very enticing rôle, both in the blood, the bile secretion, and in the gallbladder itself, as shown by Boyd.[8] McMaster has shown that the output and concentration of this difficultly soluble substance in the bile are profoundly modified

by dietary influences. A diet rich in fats with their high lipoid content undoubtedly leads to cholesterosis of the gallbladder and hypercholesteremia. The latter condition obtains, as we have known for a long time, in the puerperium and is unquestionably related to the high ratio of cholelithiasis in women who have had multiple pregnancies, the cholesterol here being derived from the involuting uterine muscle. When a few more fixed facts are established we can proceed to correlate the blood values with the and our knowledge, while greater than that of the foregoing functions mentioned, would be vastly greater than it is, were that excretion to the outside as is the urine. Up to the present there is no acceptable artificial liver function test. The phenoltetrachlorphthalein test has probably been most thoroughly tried and the best that can be said for it is that it will show a parallel retention to that of bilirubin in the blood stream, and the worst, that it is not without danger to the patient.

V

CHOLELITHIASIS

Women or often female type male.



		During colic attack	Interval
Urine	Bilirubin	0 to ++	0
	Urobilin	++ to +++	0
	Urobilinogen	++ to +++	0

The liver threshold for urobilin is relatively very low compared with bilirubin. In mild parenchymatous swelling or passive congestion or toxic reaction or transient lymphangitis of the radicles of the gallbladder tubules and parenchyma, urobilin will overflow into the blood stream and, since the renal threshold has the same relative status, will appear early in the urine and disappear late. The bilirubin, on the other hand, is late to appear (blood bilirubin must be high) and early to disappear because of the high threshold at the kidney door. Hence it is unusual for the index to be above ten in an uncomplicated gallstone attack, while urobilin will be present in large quantities in the urine. For bile index values of 100 or over a complete inflammatory or stone closure of the common duct must supervene for at least twenty-four hours.

duodenal values and the gallbladder rôle and probably solve a very large class of so-called strawberry gallbladders. The duodenal colorimetric test as yet is a doubtful one.

6. Jaundice is fathered by the blood and born of the liver; the liver in so far as the biliary function is concerned is an excretory organ

Berger[9] et al., in parallel function tests, summarize in the following table the positive and negative results in their *control* cases. This table and their remarks as regards their evaluation, to-wit:

1. That none of these tests are specific for liver dysfunction.
2. That these tests are specific but many per-

sons have latent liver damage or liver dysfunctions that are transient and are undetectable by ordinary means—

is sufficient commentary. Specifically to be noted is the fact that of the five tests the urobilin test alone accords with the clinical facts.

TABLE VI*

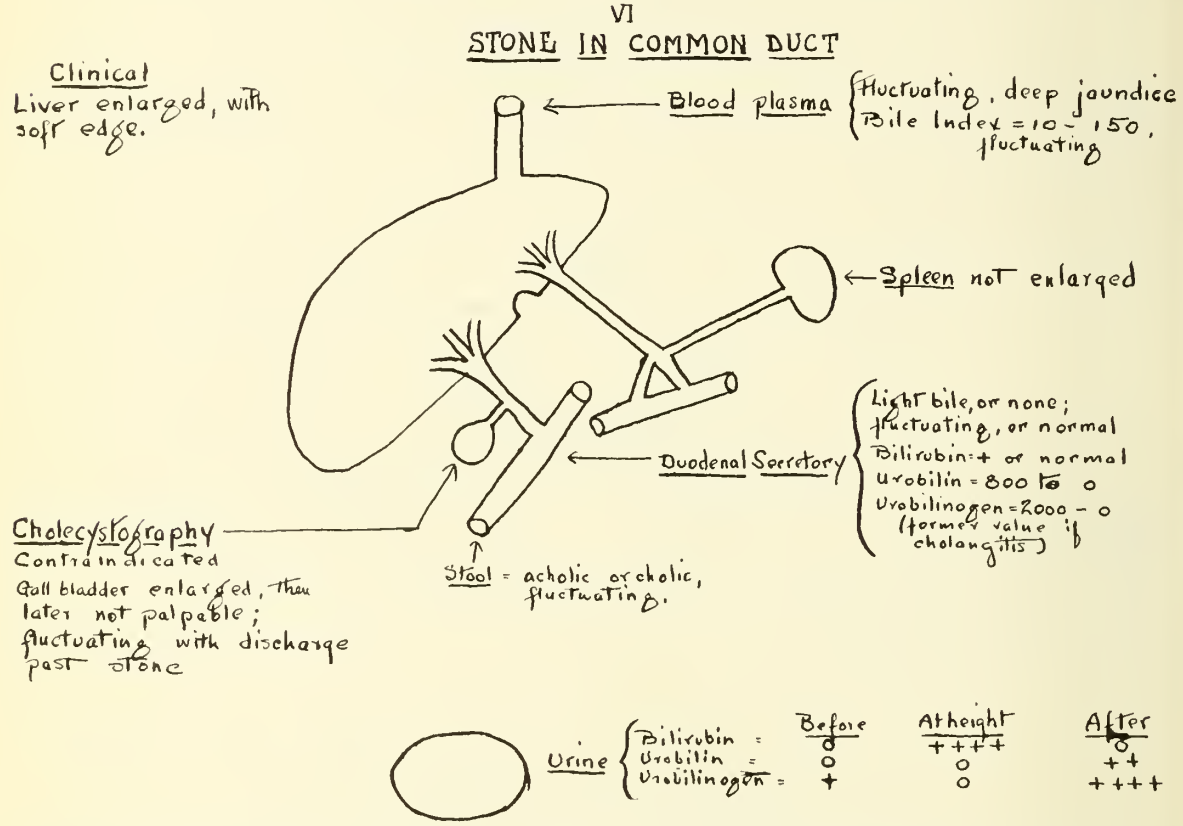
Vonderbergh		*Widal*		*Dye*		*Urobilin*		*Bile Salts*	
Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.
421	57.9	39.4	60.6	10.5	89.5	5.5	94.5	23.6	76.4

These are results of tests in cases with clinical conditions in which liver disease was unsuspected; namely *controls,* and embrace thirty-eight observations.

We will proceed, then, to a study of the excretory function of the liver judged by the play of biliary pigments and their pathological derivatives; their behavior in health and disease. I believe it offers by far the most reliable and fruitful field in clinical worth.

For a basic understanding it is necessary to know what the normal pigment output as it issues from the duct is; what the normal blood pigment level is; what the threshold in the liver for bilirubin and urobilin is; what the kidney threshold for both is; and what variations are produced by the daily routine, food, drink, exercise, bowel habit, etc.; and last but not least what variations are produced by menstruation and pregnancy and the puerperium.

VI



While colic usually attends the migration of a common duct stone, pain may be totally absent. Then, particularly in an elderly person, carcinoma is favored. A daily bile index with a daily qualitative urobilin test will in the presence of stone give fluctuating values, and so long as urobilin is present in the urine it can safely be said that there is no complete obstruction except where infection is added to the picture. If infection in the duct (usually chills and fever) is present, then urobilin will be present in the urine even though there is complete common duct obstruction below this point. So-called clay stools may be misleading unless tested for urobilin, since the patient may be on a milk diet, etc., productive of a very light stool.

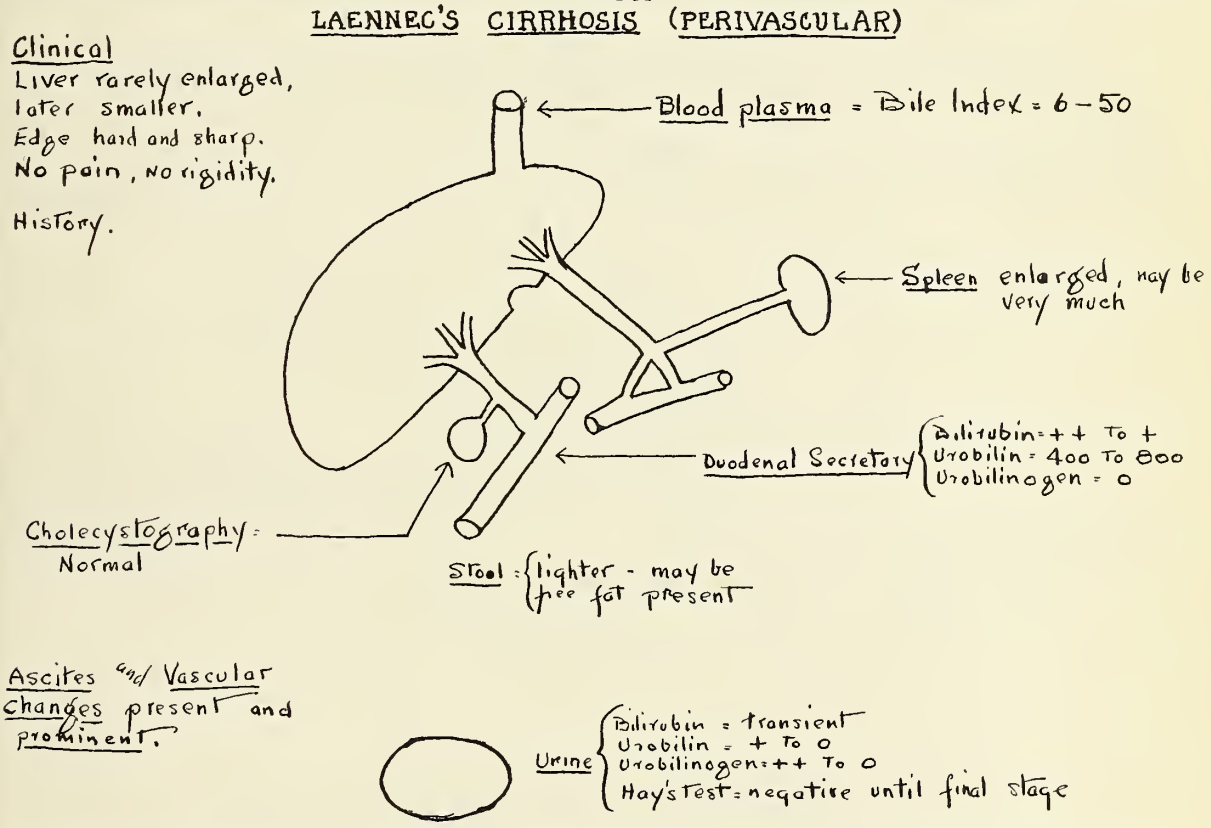
Bile is being excreted by the liver continuously, day and night, and even in man, during long fasts of fifteen to thirty days, bile appears steadily in the duodenum. The liver flow is a steady stream —the gallbladder occasions the tides. I convinced myself of this while working with healthy student material in 1920. Carlson has recently emphasized this strongly. The daily quantity in

*Berger et al., Jour. Am. Med. Assn., April 10, 1925.

the adult is between 1,000 and 2,000 c.c. Normally the larger ducts add much mucin. The color is golden yellow but may apparently, in health, vary into the brown or green, depending upon oxidizing or reducing bacteria in the liver or ducts or both, acting upon bilirubin. The pigment forming the body of the bile is bilirubin, while in health urobilin also can always be demonstrated in the duodenum. The former can be estimated in a rough manner colorimetrically after conversion into biliverdin, or, like the latter, are reliable, since the excretion secured comes directly from the liver, provided, as I have advocated for years, one does not resort to drugs or food which bring the flood tide out of the gallbladder as oleic acid, strong peptone and sometimes magnesium sulphate will.

Bilirubin in the normal blood has a level of 3:200000. The kidney threshold in man is 1:50000. A twelve-fold increase is therefore necessary before bilirubin is excreted by the kidney and a still higher level before the skin reg-

VII



No pain (spontaneous) until very late in the disease when pain may simulate cholelithiasis (without stones being present) especially if acute yellow atrophy supervenes. In cirrhosis hepatis we are dealing with the results of disease alteration and of compensatory effort as in contracted kidney. As with the kidney the *anatomical* decline is much more marked than the physiological. Its excretory function is relatively well retained until very late and the brunt of the changes are in the tributary vascular field just as in the kidney the circulatory features are in the foreground. During an intercurrent infection with even mild hepatitis such a liver will show immediately retention signs of high degree (bile index, etc.). The steady changes are portal-hemorrhoids, ascites, esophageal varices, stasis in the gastric and bowel mucosa with lowered function, etc.

measured by spectrometric or photospectrometric methods.

"B" bile of Lyon is not what he contends, pure gallbladder bile, but liver bile, as has been repeatedly demonstrated by duodenal work in patients with no gallbladder or in animals with the cystic duct ligated.

For liver testing, then, duodenal pigment studies isters. Bilirubin does not readily leave the blood vessel normally—lymph vessels rarely even show a trace except upon the addition of another factor producing friability of vessels. The liver threshold for urobilin is certainly many times lower and the kidney threshold approximately 1:500000. This results in instances of mild parenchymatous swelling of the liver, passive venous

congestion, toxic reaction or transient lymphangitis of the radicles of the gallbladder and near parenchyma producing very quickly an overflow of urobilin and urobilinogen down the biliary tract and back into the blood pool with its early appearance in the urine.

Increased drinking of liquids often increases the total quantity of bile to over 2,000 c.c. per twenty-four hours but does not increase the total bilirubin content—the bile is simply thinner and of lower specific gravity.

Increased muscular effort, if not accompanied by very much increased fluid intake, leads very decidedly to thickening of the bile, higher concentration of pigment and increased total pigment output—both due to fluid loss and to increased transport of effete corpuscular waste to the liver.

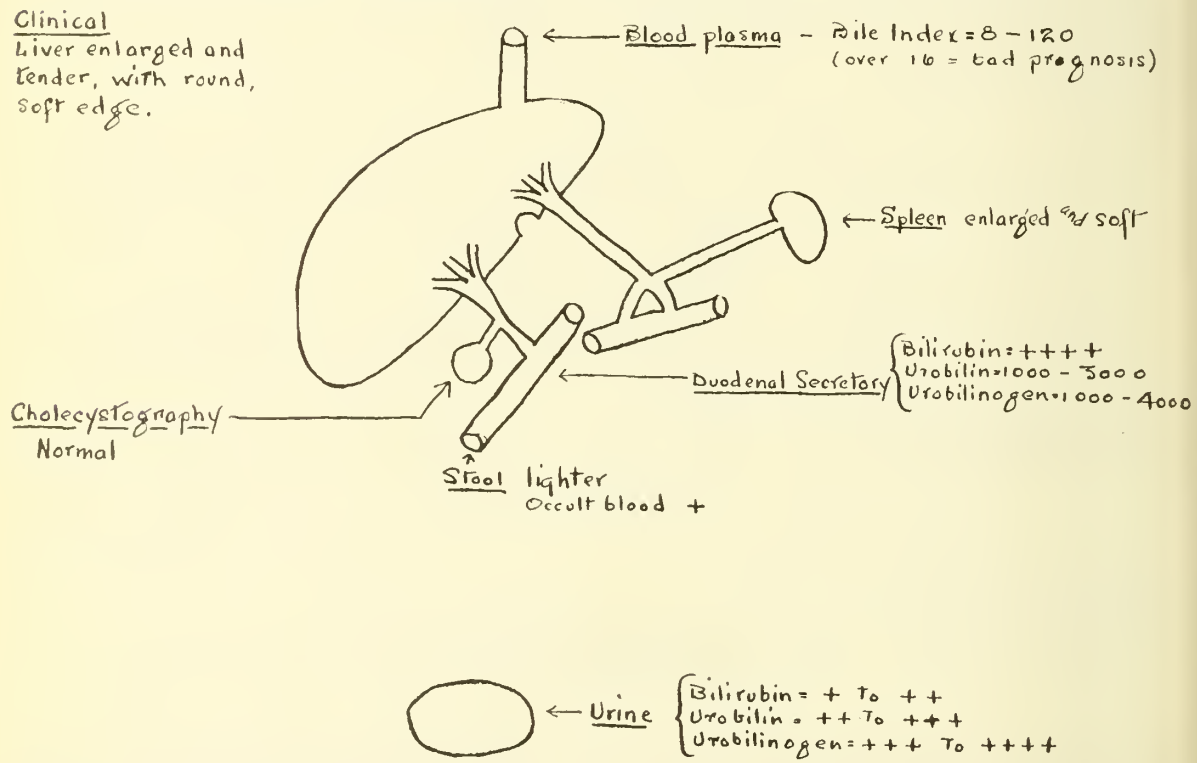
Fasting is attended by increased bilirubin content of the blood, due, in all probability, to the lack of the pace-making influence on bile secretion and liver activity of the bile salts which in the fasting state are not actively absorbed from the bowel. Here, then, is chemical evidence of that uncomfortable "bilious" feeling attendant upon the "empty state."

The direct food influence on the bile index in the blood is negative, there being no tide such as we find in the metabolism of the sugars.

The emptying of the gallbladder and increased activity of the liver following the ingestion of fat may be due to specific stimulation of bile salt production. This remains to be seen. That constipation as against normal daily movements of the bowel has no influence is definitely established. However, a cathartic effect upon the small bowel, particularly that of magnesium sulphate, is to sweep out much bile pigment—bilirubin as well as urobilin—which would otherwise be resorbed and revamped. To repeat this fre-

VIII

PASSIVE VENOUS CONGESTION OF LIVER (HEART and LUNG DISEASE)



In acute congestion of the liver following diphtheritic myocardial disease, paroxysmal tachycardia or coronary thrombosis (especially of the right coronary) and tricuspid regurgitation secondary to decompensated mitral disease, the pain is severe in the right hypochondrium. The effect of digitalis can be determined with remarkable accuracy by daily urine pigment determinations as well as bile index values. When the bile index in chronic congestive failure in spite of good treatment remains steadily over fifteen or sixteen, the prognosis is not good.

quently, however, can well be conceived to lead to lessened bile flow and liver function due to bile acid depletion.

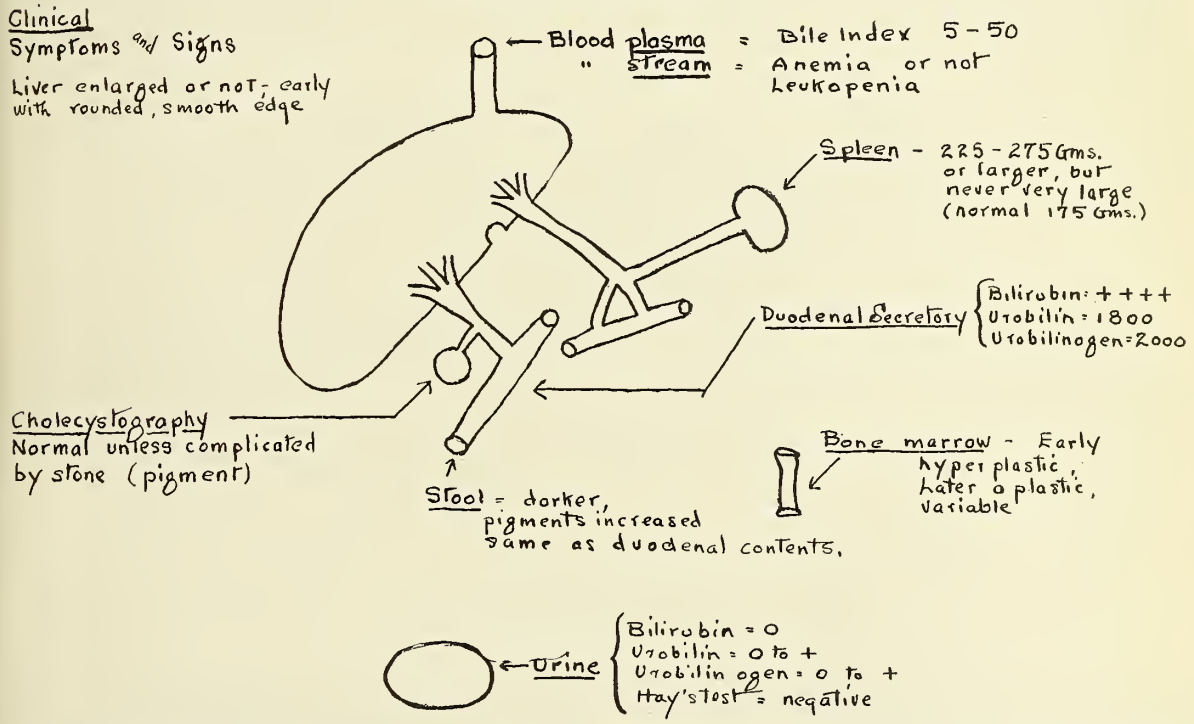
Menstruation, particularly at the onset, is attended by a heightened tonus of the sphincter of Oddi and consequent increased intraductal pressure against which the liver must excrete. How much the liver is actually inhibited, if at all, is not established. During normal pregnancy the biliary pigments are not altered from the normal although some work done points to an increased duodenal content of urobilin and at times urobilinogen, a pathological pigment in such patients as have simple vomiting of pregnancy without manifest toxemia. In the toxemia, decided evidence of liver injury can be obtained by the duodenal estimations by the blood bile index, and the play of pigments in the urine. The impression is forced on one that the pregnant state is one which taxes the liver function to its utmost. During the puerperium, while the uterus is involuting and the blood debris is being resorbed, there is an increased concentration of the normal pigment, bilirubin, and of cholesterol in the bile output.

The liver secretes against a pressure in the common duct of 60 mm. of water. The sphincter of Oddi has a resistance of 120 mm. of water, the cystic duct only 30 mm. Hence, during expiration the gallbladder fills—during inspiration, due to increased intra-abdominal pressure, the pressure in the gallbladder rises to 100 mm.

Tonus changes are to be added—especially such as occur as a result of emotion, menstruation period, etc. The gallbladder mucosa has great concentrating ability so that many more

IX

PERNICIOUS ANEMIA



The change in the liver in pernicious anemia is produced largely by two factors: (1) overwhelming hemosiderosis—this pigment debris leading gradually to cirrhotic changes precisely as produced by any other foreign material; (2) toxic fatty degeneration. The liver always enlarges during the crises of the disease and recedes during the remission. Later, as the liver hardens, the changes are less marked, but the liver may again enlarge following cardiac failure. The spleen also goes through parallel changes but they are less marked and often in the elderly patient cannot be demonstrated.

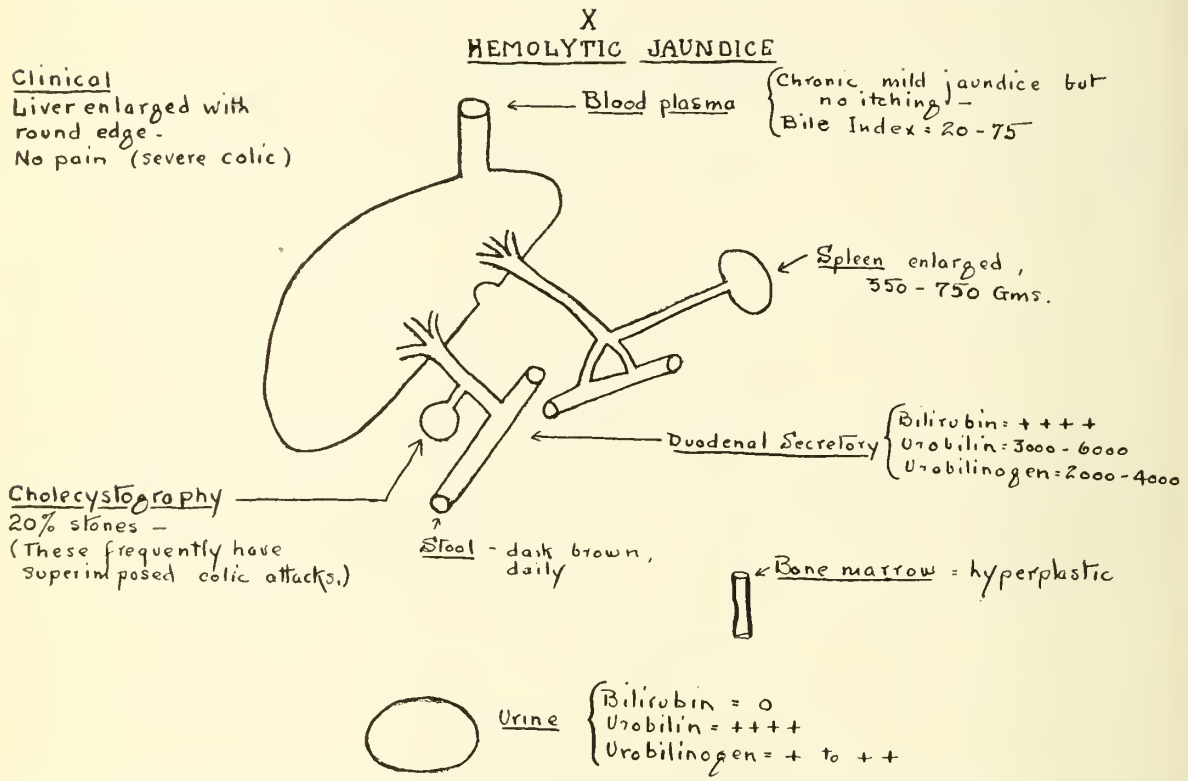
The relief in pernicious anemia from splenectomy is probably accounted for by removing one-third of the portal blood flow to the liver, and in that degree saving it from the flood tides of pigment. The operation of enterostomy (Seyderhelm) during its existence drains away much pigment that must otherwise be resorbed and rehandled by the liver. Other than that it does not influence the disease.

times the volume enters than leaves it. After cholecystotomy the sphincter of Oddi resistance drops to 30 mm.

The gallbladder function may be summarized as follows:

1. Fills during fasting. (Hence five feedings per day in cholecystic cases accounts for relief obtained.)
2. Empties following food ingestion—the rapidity very markedly influenced by character of food.
3. Protein and carbohydrates six to twenty-four hours and often never at any stage completely collapsed.
4. Fat, especially a mixture of egg-yolk and cream, causes a completely collapsed gallbladder in two or three hours.

   (This phenomenon accounts for qualitative dyspepsia in gallbladder disease, especially the intolerance to fat, mayonnaise dressing, etc.).
5. There is still doubt as to how much aside from water of the gallbladder contents is expelled through the cystic duct and how much and what substances are resorbed through the gallbladder mucosa.
6. Muscular effort attended by perspiration lessens volume of bile entering gallbladder and very greatly lessens the unit work of the gallbladder.
7. On the contrary, a sedentary life, especially attended by much liquid consumption (beer in the days of alcoholic cirrhosis), greatly enhances the work of the gallbladder for two reasons:
   (a) Increased volume of liver bile needing to be concentrated by gallbladder.
   (b) Lack of respiratory activity retarding emptying of gallbladder.
8. Pregnancy and the menstrual period are attended by at least three now well grounded reasons for forming gallbladder disturbances:
   (a) The proven increased tonus of the sphincter of Oddi at both periods (pituitrin?).
   (b) The tremendous burden placed upon the biliary apparatus following delivery from cholesterol enhancement.
   (c) The decreased intra-abdominal pressure offering insufficient resistance to descent of diaphragm and decreased respiratory emptying of gallbladder.



The spleen and splenic vein in acquired hemolytic jaundice are the seat of the disease. Splenectomy results in a cure.

The spleen is the large central station for pigment manufacture. This is anatomically evidenced by the fact that the artery is the largest branch from the celiac axis and the vein contributes 30 per cent of the entire portal vein volume. The change in the spleen is produced by a mechanical stasis—a local passive venous congestion of the spleen with a final fibrosis.

THE ROENTGENOLOGY OF GALLBLADDER

The very recent clinical application of the Graham-Cole method of visualization of the gallbladder by the use of the intravenous or oral administration of tetraiodophenophthalein marks an important milestone in the study and under-

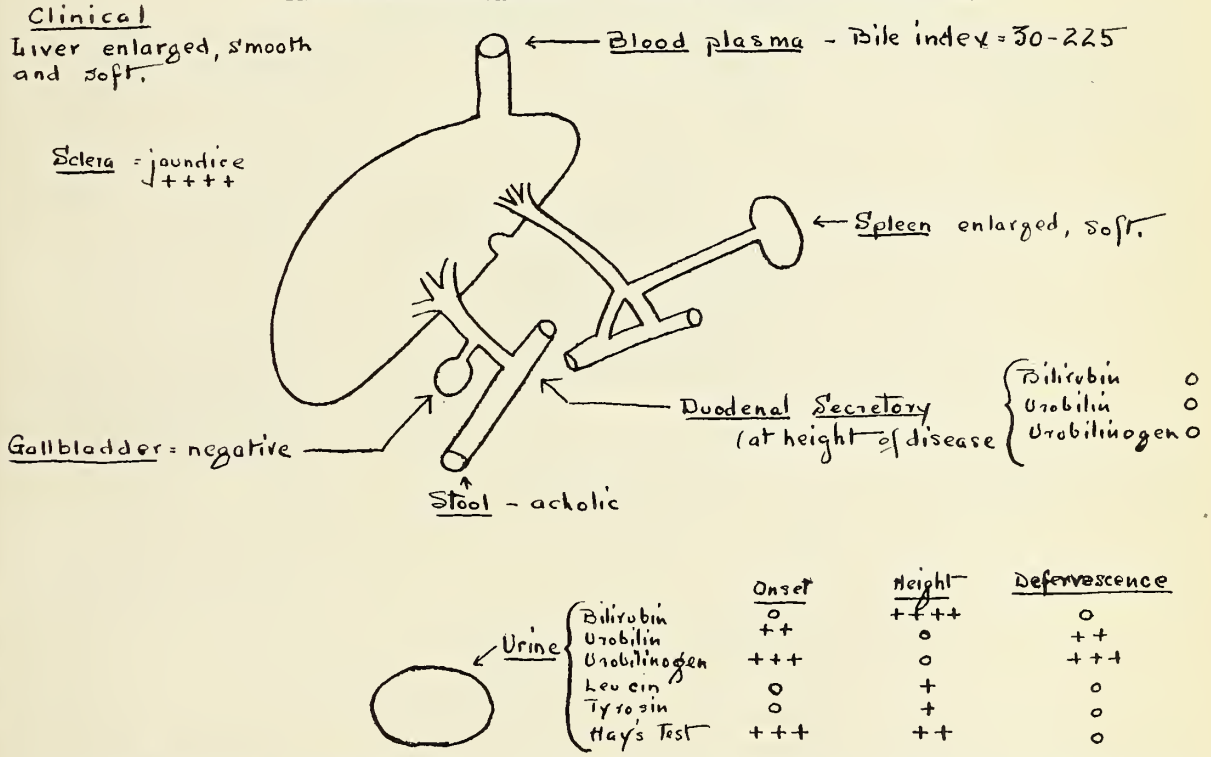
standing of the biliary tract. The gallbladder fills out with a uniform dense shadow taking on its shape and size twelve to fifteen hours after ingestion of the dye. After a meal, especially of egg-yolk and cream, the normal gallbladder at a second picture in three hours will be nearly empty or entirely so. After a mixed meal longer. Whatever its size it is like the stomach, always full, having, therefore, a function of peristole.

This new method has as in the case of the stomach taught us already certain errors handed down for clinical application derived from the post-mortem room or operating table.

1. That the gallbladder is not in the right hypochondrium in more than 25 per cent of the patients. That when it is there instead of being in the longitudinal line that separates the right hypochondrium from the epigastrium it is often in the line that separates the right hypochondrium from the axillary region.
2. In 75 per cent it is below the limit of the hypochondrium or epigastric region—either in the umbilical or right lumbar region. It may be at or on a line with the anterior superior spine of the ilium and what was formerly suspected to be a ureteral stone proves by cholecystography to be a gallstone.
3. The change in position from the lying to the standing position in the individual with normal tonus does not exceed one inch; in the relaxed visceroptotic, it may be three or four inches.
4. Many gallbladder shadows by our former technic were missed because the shadow fell upon that of the spine.
5. The acutely or subacutely inflamed gallbladder will not take the dye. This is particularly true soon after a cholecystic attack.
6. The obliterated contracted gallbladder will give no shadow.
7. The gallbladder with obstructed cystic duct also.
8. The chronic gallbladder may show a shadow which is deformed or horizontally placed (found at operation to be adherent to under surface of liver).
9. A gallbladder shadow of very large size, hydrops of the organ, or delayed emptying.

XI

CATARRHAL JAUNDICE —ACUTE YELLOW ATROPHY



Acute catarrhal jaundice of the infectious epidemic type which we see in this state particularly in the months of November and December is not serious and only once have I seen such a patient remain jaundiced for full eight weeks. There is a type following an unknown gastrointestinal infection which may go over into acute yellow atrophy or terminate in cirrhosis. When bilirubin persists in the urine for a week without a return of urobilin and Hay's test has been positive (the first day or two) then a permanent pathologic change of more serious character is to be expected.

Icterus during pregnancy if associated with hyperemesis, salivation or eclampsia is serious and needs careful evaluation, for acute yellow atrophy may set in with the usual fatal outcome. The process is probably autolysis of the liver brought about by tryptic ferments and is not unlike fat necrosis of pancreatic origin.

10. A normal gallbladder shadow—bearing within it one or more negative shadows (gallstones).
11. A late twenty-four to forty-eight hour picture of the gallbladder may give a series of ring shadows —coated gallstones.
12. While the dye is apparently without danger in deeply jaundiced patients no shadow of the gallbladder can be obtained irrespective of whether the jaundice is obstructive or infectious in type.
13. The study of the gallbladder by this method already has thrown great doubt upon the value of pain in the right hypochondrium or directly under the right rib margin as a diagnostic sign of gallbladder disease. Most frequently this is a traction pain.
14. In many cases where gallstones are visualized there appears to be a surprisingly good function (radiographically) of the gallbladder.

That such might well be the case can readily be appreciated by a glance at this classification of gallstone formation. At least 35 per cent of stones are formed as a result not of gallbladder pathology but disturbed liver function entirely aside from infection.

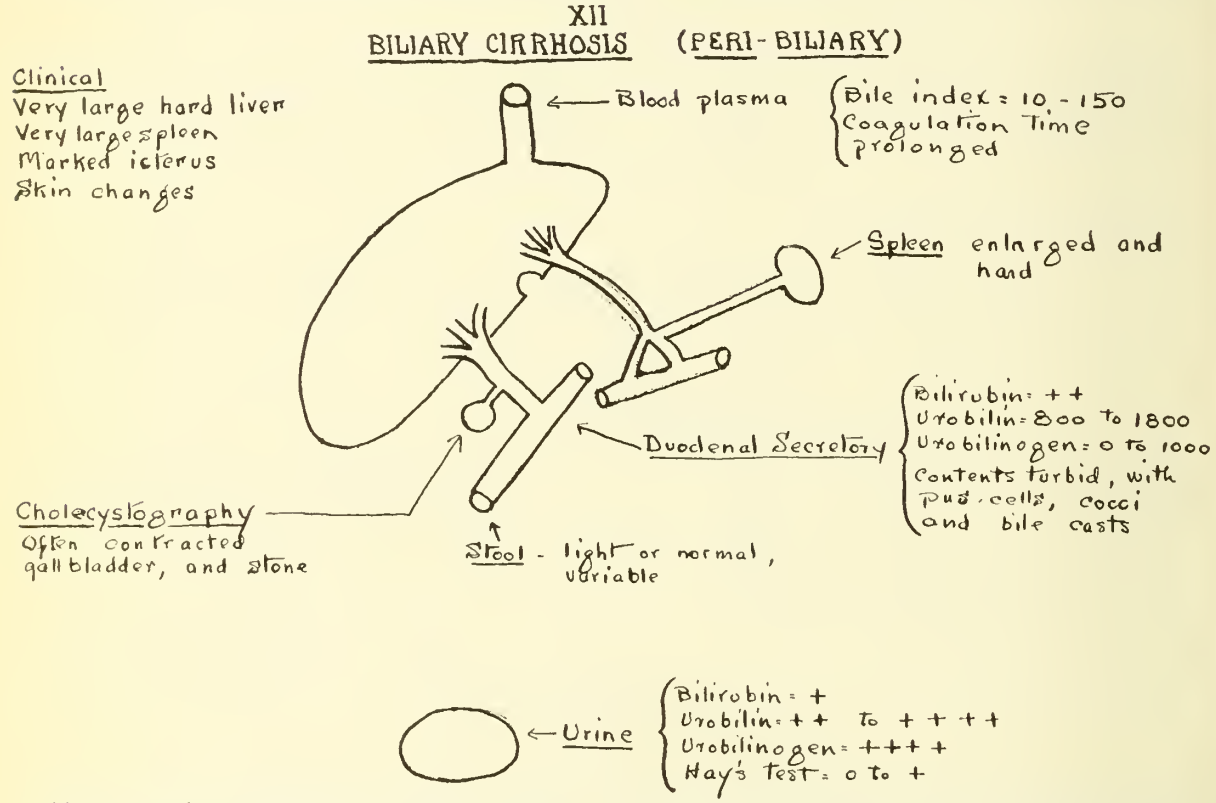
GALLSTONE FORMATION

I. *Inflammatory Stones* (60 per cent): Bilirubin, cholesterin, calcium stones.
   1. Precipitation of cholesterin out of colloid state in gallbladder and wall tufts.
   2. Crystallization in rosette formation around a nucleus.
   3. Agglutination into kernels with incorporation of bilirubin, calcium, bacteria, etc.
   4. Absorption until osmotic balance.
   5. Facet formation.
   6. Crop formation of stones.

II. *Cholesterin Stones* (25 per cent) always single.
   1. Metabolic stone—due to hypercholesteremia occurring in puerperium and hypercholesteremia of superalimentation.
   2. Round, hard, dark spiculated uniform throughout.
   3. Other stones added are of Type I.

III. *Bilirubin Pigment Stones*—multiple.
   1. As in preceding no macroscopic or microscopic evidence of present or past inflammation of gallbladder.
   2. Due to pleochromia—high waves of pigment concentration as result of fulminating blood destruction wave especially in *hemolytic icterus* and *pernicious anemia.*
   3. Uniform dark mulberry type.

IV. *Static Stones*—Form only in biliary passages plus obstruction, plus infection—egg-shaped yellow or brown, with layering of bilirubin.



Biliary cirrhosis and Laennec's cirrhosis are at times mixed in type for etiologically there is very little distinction. The more marked bile tubule stasis in the former leads to infection and greater toxic effects. This infection in certain types seems to be introduced to the liver via the spleen so that splenectomy may markedly improve the liver—this being particularly true in syphilis with chronic nesting of spirochetes in the spleen.

The icterus index[10] has the following said for it:

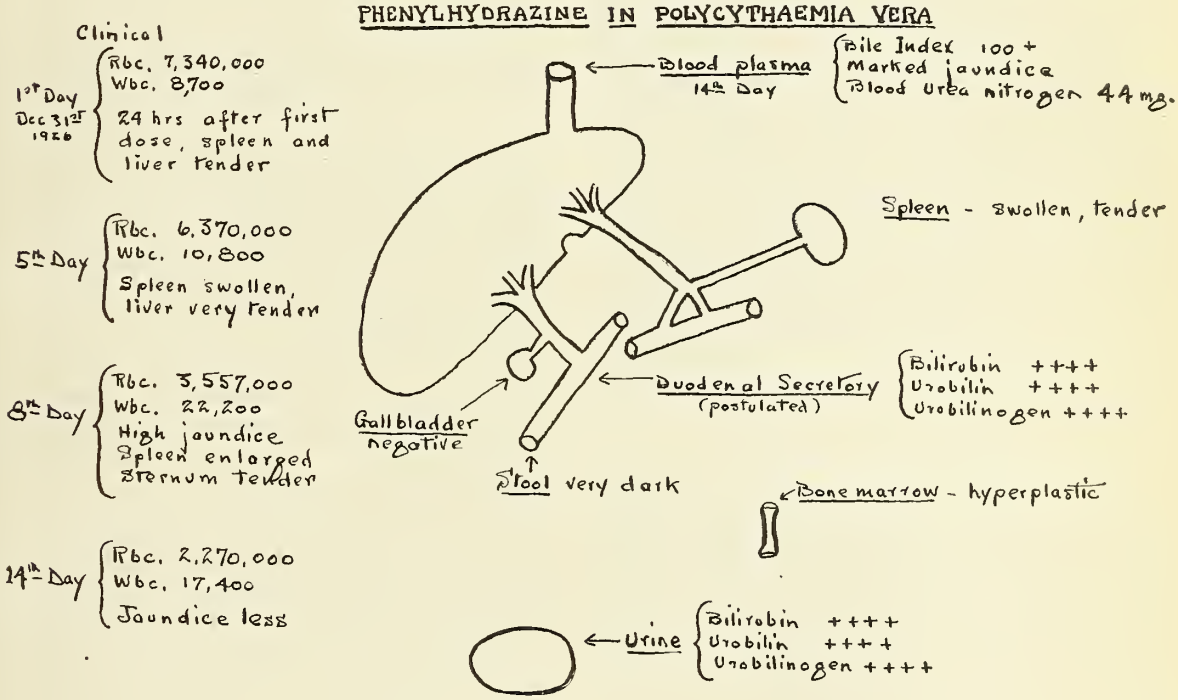
1. It is easily performed and is not dangerous.
2. Its greatest value is in the diagnosis of cases of cholecystitis and cholelithiasis without clinical jaundice.
3. It is differential between catarrhal jaundice (acute hepatitis) and obstructive jaundice due to malignancy by showing that the jaundice is increasing, diminishing or stationary.

great assistance in detecting cholecystitis and cholelithiasis is obvious from the facts as stated that a good deal of total liver injury or a common duct obstruction, or a very marked hemolysis is necessary for its radical departure from normal.

Recently we had occasion to treat a patient affected with polycythemia vera by the ingestion of a powerful hemolytic poison—phenaldydrazine. From a red blood count of 7,340,000 we were able to produce a diametrically opposite

XIII

PHENYLHYDRAZINE IN POLYCYTHAEMIA VERA



See text.

4. It is also of value in differentiating between malignancy and common duct stone.
5. It is indicative of the degree of cardiac decompensation.
6. It may act as a guide to the tolerance of the liver to arsenicals.
7. It may be useful in determining when obstructive jaundice has been relieved by operation.
8. It may be used to differentiate between primary and secondary anemia.

To properly evaluate the icterus index, its value must be taken with the duodenal and urinary values as well as the roentgenological and clinical facts. The time element must be carefully considered. That it will not probably be of

condition of anemia with a red blood count of 2,700,000 in the course of fourteen days. The clinical picture was one of fulminating liver disease to the uninitiated. The patient became heavily jaundiced; the spleen fairly popped into prominence; the liver bulged and there was a vivid distress in the right hypochondrium; the patient vomited bile repeatedly and the urine was freighted to the guards with pigment, and the bile index in the blood much over one hundred. If we had performed duodenal drainage, which we spared the too sick patient, we would without doubt have found extraordinary high values for bilirubin, urobilin and urobilinogen. Yet, withal, there was not the slightest clinical point to be made out for liver injury. The entire destruc-

tive play was in the blood bed, and, from the cellular studies of the blood, made by Drs. Carey and Altnow, we are sure in the marrow. If this overwhelming pigment excretion had been kept up (which was of course impossible because of insufficient supply) then it is conceivable that an injury of the liver itself would of necessity have resulted as it does in all chronic hemolytic disease.

This experience enables us the better to see why we have, in the past, been so often misled, just as we did in the field of kidney pathology, into regarding the liver as guilty because of its proximity to the greatest evidence of the injury.

With this experience in mind it is not inconceivable that we will find in the future that many toxic actions of bacteria (such as the toxins of the streptococcic group) are not producing the signs of liver injury as a result of liver cell destruction but as a result of hemotoxic action. That this blood destruction can occur very rapidly and that recovery will occur when the bacterial invasion is a transient one is evident from cases of acute pernicious-like anemias such as were reported recently by Lederer,[11] Brill,[12] and E. Moschowitz.[13]

SUMMARY AND ADDENDA

The most accurate and delicate single liver parenchyma function test in the absence of total duct obstruction is the play of urobilinogen in the fresh urine. In the presence of total duct obstruction and consequent jaundice the best functional test is the oral administration of bilirubin with the urinary consequences. In this latter situation, if the parenchyma is normal, no urobilin will appear in the urine; if it is damaged, the degree of damage at the time of the test will be reflected proportionally in the urine. It goes without saying that hemolytic disease must naturally first be excluded.

The small amount of urobilinogen normally found in the urine is the urinary factor—the stool pigment the other—of the total end pigment output of the normal daily blood destruction. When testing in *fresh* urine adding 1 c.c. of Ehrlich's aldehyde reagent (paradime-hylamidobenzaldehyd 2 gms., 15 c.c. of 38.5 per cent HCl, 15 c.c. of H_2O) to 5 c.c. of urine will in the presence of the pigment give in *cold urine* in one or two minutes the characteristic red color. If the reaction is in doubt add a few c.c. of chloroform and shake, when the latter will take up the color in a clear solution.

If green pigment comes out and confuses, this is bilirubin converted into biliverdin by uric acid in the presence of nitrites. These latter occur in putrefying urines, but also in fresh urine from urinary tract infected with organisms liberating nitrites. Indol and skatol (pyrrhol derivatives) give the aldehyde reaction but are never in sufficient quantities in the urine to be of clinical importance. Urotropin inhibits the color reaction entirely—a clinical fact that should be borne in mind.

In testing for urobilin Schlesinger's solution (1 per cent zinc acetate in 95 per cent alcohol) is used. To 5 c.c. of urine are added two or three drops of Lugol's solution and the same allowed to stand a few minutes. Two or three drops of ammonia are added and 5 c.c. of Schlesinger's solution and filtered and the filtrate examined for green fluorescence; allowing the light to shine through the test tube diagonally against a dark background.

Leucin and tyrosin are difficult of demonstration. Clinically, to determine liver destruction, it is better to test in the urine for amino acids by the use of Millon's reagent. A very dark red color is positive.

Hay's test for bile acids in the urine is clinically very useful, but has certain errors unless great care is exercised in using only perfectly dry sulphur, allowing none to touch the sides of the conical glass and reading the result in five minutes, not later.

In the examination of the fresh stool or stool protected from light exposure for the presence or absence of urobilinogen it suffices to take a hazel nut size piece of stool in 5 c.c. of a warm solution of 1 per cent tartaric acid in 95 per cent alcohol, and shake to extract the pigment, and filter. Then add 1 c.c. of the aldehyde reagent and extract the color with a little chloroform. The tartaric acid alcohol extract prevents indol and skatol bodies from entering the reaction, as of course they are very abundant in the stool.*

The bilirubin liver function test in the presence of complete obstruction can be carried out as follows: For each ten pounds weight of the

*For the technic of duodenal pigment estimation see "The Splenic Pathology of Pernicious Anemia and Allied Conditions, A Duodenal Method of Estimating Hemolysis," J. P. Schneider, M.D., Arch. Int. Med. 17:32 (Jan.) 1916.

patient give by mouth one-half grain of chemically pure bilirubin. Save all the following twenty-four hour urine in a dark glass bottle. Test a sample from this for urobilinogen. If it is absent the liver parenchyma can be assumed to be still functioning well. If it is present, the stronger the reaction, the poorer the total parenchyma is functioning, at the time the bilirubin was given.

BIBLIOGRAPHY

1. Rous, Peyton: Biliary aspects of liver disease. Am. Jour. Med. Sc., 170, 625, (Nov.) 1925.
2. Schneider, J. P.: The splenic pathology of pernicious anemia and allied conditions. A duodenal method of estimating hemolysis. Arch. Int. Med., 17, 32, 1916.
3. Schneider, J. P.: The hematopoietic-hemolytic index: A proposed determination helpful in the differential diagnosis of types of pernicious anemia amenable to cure via splenectomy. Journal-Lancet, Feb. 15, 1917.
4. Schneider, J. P.: Further quantitative study of the duodenal blood-derived pigment. Arch. Int. Med., 19, 156, 1917.
5. Schneider, J. P.: A study of the bile pigments in pernicious anemia. Jour. Am. Med. Assn., 74, 1759, 1920.
6. Platou, E. S.: Schneider's test in pernicious anemia. Case report. Coney Island Med. Jour., 15, 272, (Aug.) 1921.
7. McClure, C. W.: Studies in pancreatic function: Enzymic concentration of duodenal contents in health and disease. Am. Jour. Med. Sc., 167, 649, (May) 1924. Also the ph. and buffer values of duodenal contents derived from normal men. Arch. Int. Med., 33, 525, (Apr.) 1924.
8. Boyd, W.: Studies in gallbladder pathology. Brit. Jour. Surg., 10, 337, (Jan.) 1923.
9. Berger, Cohen and Selman: Liver function tests. A comparative study of five methods in one hundred clinical cases. Jour. Am. Med. Assn., 86, 1114, 1926.
10. Murphy, W. P.: Easy method of estimating amount of jaundice by means of blood serum. Bost. Med. and Surg. Jour., 194, 297-299, Feb. 18, 1926.
11. Lederer, Max: A form of acute hemolytic anemia, probably of infectious origin. Am. Jour. Med. Sc., 170, 643, (Oct.) 1925.
12. Brill, I. C.: Acute febrile anemia. Arch. Int. Med., 37, 2, Feb. 15, 1926.
13. Moschowitz, E.: Acute febrile pleiochromic anemia. Arch. Int. Med., 36, 1, (July) 1925.

UROLOGIC DIAGNOSIS IN GENERAL SURGERY*

A. E. Sohmer, M.D.
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The work of the surgeon of today includes far more than mere "operating" or cutting tissues. With a reasonable natural adaption and practice, the technic of surgery is rather easily acquired, if one speaks of surgery as merely cutting, draining, removing or transplanting tissues.

Surgery in its broader sense, to be worth while, includes a thorough knowledge of anatomy, pathology, history and progress of disease, as well as diagnostic acumen and judgment. It implies, further, equipment and training which enable one to arrive at a diagnosis and adopt a well-laid plan of procedure in attacking the disease at hand. Further, it requires a checking up and evaluation of the body structures and functions as a whole; as to cardiovascular, renal, hepatic and internal secretory status and efficiency, so as to determine the exact state of function and organic reserve.

The study of such functions in operative cases has made possible the brilliant and more safe operative interference in thyroid, hepatic, diabetic, prostatic and gastrointestinal surgery of recent years. Much of the guesswork and hope of former days has progressed to fact and faith of today. All this has been made possible by the combined work of the internist, laboratory and experimental worker, as well as the surgeon and the specialist in various lines.

This also means that when the patient arrives on the operating table, a thorough estimate of his organic functional resources has been established, and likewise a definite diagnosis of the existing disease has been carefully made—an accumulation of the efforts of many lines of endeavor.

Furthermore, even though a patient has a disease which ordinarily would suggest operative interference, unless the chances of this patient are better by operation, judged by a proper review of all the organic functions of the body, operation should be deferred or definitely abandoned, and such other treatment, alone or followed by surgery, should be undertaken, as is found best for the particular case at hand. Many a patient would be saved operation, or the latter would be

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 17-19, 1926.

better directed, if these factors were always considered.

In the old days of fee splitting and hurried operation of patients with their shoes on, the patient had no fair chance. The scientific and honest surgeon will not operate, but refer his patient to other departments for coöperative care and treatment, rather than go ahead unprepared and in a hurried way.

It is for these reasons that surgery today does not mean merely "operating," but it does mean the application of therapeutic measures, as indicated: operating if needed, and then only after thorough functional and diagnostic studies have been made. The field is broad, requiring the coöperation of all departments of medicine; likewise the training of surgeons in more than mere technic.

These introductory remarks lead us to the subject at hand, illustrating one field of many in which the surgeon should be trained, in diagnosing disease and preparing patients for operation, namely, urology. Urology as a specialty has been developed in the last two decades to the eminent position of a rather exact science. Many illustrious names are interwoven in the story of the development of the diagnostic and operative procedures used in this work. The laboratory worker has rendered invaluable aid in perfecting blood chemistry and functional kidney tests; the *x*-ray specialist is at hand with his intelligent coöperation; the medical clinician rounds out the team work in applying and correlating these laboratory tests—all to the advantage of the surgeon, who applies the final indicated therapeutic measures.

Differential diagnosis finds urologic diseases often mistaken for other surgical conditions; for instance, an innocent, as well as a moderately diseased, appendix has been removed instead of a calculus lurking in the ureter. Useful and harmless female generative organs have been sacrificed, before a ureteral kink or stricture was discovered and remedied. Because of relatively obscure symptoms and signs, and the occasional difficulties of technic in diagnostic procedures, the simpler and more common operations have been hastily done, while the real and more obscure, even though more important, cause has been overlooked. Still more tragic are the cases of acute pyelitis that have been operated for intestinal obstruction because of the accompanying tympany, constipation and vomiting. Patients have had an innocent prostate removed, when the obstruction was due to a urethral stricture, or phimosis, or hypospadias with attendant obstructive cystitis.

These are but a few examples which come to mind in a review of the cases which very often come to the busy surgeon for operation.

Needless pain and expense and loss of time is offered up on the altar of ignorance and haste, and life is made less pleasant and sometimes sacrificed because a vital member of the urologic system is strained by the anesthetic or the operative shock of an unhappily chosen time or field of attack, or of an unprepared body as a whole.

It is our plea that the man who would do surgery should have a working knowledge of these things, or have access to them through his colleagues.

In conclusion, the general surgeon should have a working knowledge in urologic conditions as to structure and function. He should be personally qualified to make the necessary examinations and tests, or coöperate with those who are. With the aid of the internist, laboratory specialist and roentgenologist, he should get all available data of the patient, as well as the local findings. Finally, the day of the mere technical operator has passed; biology and physiology and their relation to disease must be taken as a whole, before conclusions are drawn and a plan of attack is formulated. This will give the clue and indication as to whether or not to operate, what to operate, when to operate, and include a well-rounded after-care for the treatment of local and general conditions.

CASE REPORTS

Case 1.—Mrs. L. R., aged 33, comes because of indefinite pelvic symptoms, including bladder irritation and pain radiating up to the lumbar region. Routine examination included cystoscopy, which showed the patient had a double ureter on the left side, this duplication being limited to the lower end of the ureter, and extending only 3 cm. There was no other pathology in the urologic system, the symptoms being traced to a chronic infection in the tubes and ovaries, which condition was cured by a later operation.

Case 2.—Mrs. C. Z., aged 57, was referred because of continued colicky pains in the kidney region. Pyelogram showed a hydronephrosis on the left side, with obliteration of the calyx markings.

Case 3.—Mr. A. C. V., aged 45, comes because of indefinite abdominal discomfort, with occasional colic, which made one suspicious of kidney calculus. There was an apical tooth infection present, and a calculus 3 x 8 mm. was shown by *x*-ray to be near the upper pole of the left kidney. Re-ray with ureter catheter *in*

situ gave the same findings. This stone was removed by pyelotomy under fluoroscopic observation.

Case 4.—Miss M. T., aged 31, was referred because of indefinite abdominal symptoms somewhat suggestive of Dietl's crisis. *X*-ray examination with barium meal suggested cholecystitis, but there was also a small renal calculus in a slightly ptosed right kidney, this calculus being 3 mm. in diameter and situated near the upper pole of the right kidney. There was also evidence of a moderate kidney infection. At operation, a cholecystectomy was done, because of chronic infection. At the same time the kidney was exposed through the same incision, which was a modified T incision of the right abdomen, and it was found that the upper third of the kidney was degenerated, the rest of the kidney being in good condition. This third of the kidney was removed, leaving the healthy two-thirds of the kidney in place. On re-raying, it was found that the calculus which caused the closure of the upper kidney calyces had not come away with the diseased kidney portion, and symptoms of a moderate degree continued, so that two months later it was decided to remove the stone. It was found that the kidney wound had healed very nicely, except that a small sinus about 1 cm. in length led from the pelvis to the kidney stone, which was in the cellular tissue outside of the kidney and was the cause of the continued kidney irritation. The stone was easily removed and the patient made a quick recovery without any leakage from the kidney.

Case 5.—Mrs. O. S., aged 24, during the course of an insurance examination was found to have evidence of kidney infection—pus and red cells being in the microscopic urine. There was a dental infection present, and cystoscopic examination showed a stricture in the left ureter. Pyelogram showed evidence of this stricture in the course of the left ureter, and also a filling defect suggestive of stone. This patient had virtually no symptoms until infection in the urine was discovered during a routine examination, and yet she had a virtually dead kidney above a strictured ureter, with impacted stone.

Case 5.—Mr. C. B., aged 58, was referred because of pains following an injury several months previous, with hematuria. Cystoscopy showed an almost complete stricture of the right ureter two inches from the bladder, with a moderate stricture of the left ureter. A pyelogram showed filling defect suggestive of stone. The urine contained no blood at this time, but the interesting thing about this case was the very advanced spondylitis deformans present. From a legal standpoint, it was important to distinguish between the actual result of the trauma and a disease of long standing as suggested by the spondylitis and kidney stone with ureteral stricture.

Case 7.—Mrs. N. A. D., aged 36, following a difficult labor, continued to have pelvic discomfort with occasional sharp lumbar pain and vesicle tenesmus. There was evidence of chronic pelvic infection, but *x*-ray also showed a small stone in the pelvis of the left kidney. Under manipulation with a ureter catheter, this stone was removed.

Case 8.—Mr. R. E. H., aged 33, was operated for appendicitis a few months ago, but continued to have symptoms of sharp pain in the right inguinal region. *X*-ray with a catheter in situ showed two calculi impacted in the lower end of the right ureter. These were removed under ureteral catheter manipulation.

Case 9.—Mr. E. B., aged 26, came in with indefinite abdominal pain. *X*-ray showed a faint shadow near the right uretero-vesical junction. Cystoscopy showed obstruction at this point. After repeated catheter manipulation, this stone was removed.

Case 10.—Mrs. H. M., aged 46, had several operations including cholecystectomy and gastroenterostomy, because of indefinite abdominal pain, associated with cholecystitis and pyloric ulcer. She continued to have discomfort, however, although her gastric symptoms had improved. *X*-ray showed a small calculus in the region of the left uretero-vesical junction, which was removed by catheter manipulation.

Case 11.—Mrs. C. K., aged 30, had symptoms suggestive of kidney colic. *X*-ray showed an opaque shadow 8 x 15 mm. in the region of the left lower ureter. *X*-ray repeated with catheter in situ showed this calculus to be in the ureter. Catheter manipulation was used to remove the stone, but the patient did not return for a check-up, because after changing the position of the stone to allow the ureter to drain, her symptoms were relieved.

Case 12.—B. E., aged 36, was referred for probable appendicitis. Examination showed a leukocyte count of 20,300. Urine showed only occasional pus cells. However, the nature of the pain and the tenderness, which was more marked in the left kidney region, with some tenderness along the right ureter, made one suspicious of kidney involvement, and the case was studied further. *X*-ray showed both kidneys normal in size and position. On the right side, apparently in the course of the ureter, at a level of the transverse process of the fourth lumbar vertebra, was seen an opaque shadow about 1 cm. in diamter and of somewhat irregular density. At this time no stone was observed in the left side. Tenderness was more marked in the left kidney. The urine still showed but few pus cells and an occasional red blood cell. The catheterized urine gave a growth of pure staphylococcus. Cystoscopy showed a general cystitis, with the right ureter obstructed six inches from the meatus and obstruction of the left one four inches from the meatus. Further study showed that a stone also existed on the left side. In other words, this patient had a chronic pyelitis, with stone impacted in each ureter. Repeated catheterization and dilatation of the ureters, done over a period of two months, did not cause the stone on the right side to move at all, and the one on the left side merely moved up and down. Because of the danger of complete obstruction, it was decided to remove these stones by open operation. Through an incision along the right rectus border, the right stone was removed extraperitoneally. It was impacted in the ureter, so that it had to be pried out, even after it was exposed by incision into the ureter. Then the appendix was removed, which showed chronic disease. Eleven days later, a left extraperitoneal ureterotomy was done, and the left stone was removed. There was a decided stricture below this stone. The patient made a prompt and good recovery.

Case 13.—W. J., aged 25, single, was referred with a history of left renal colic. At home the physician took an *x*-ray which showed a shadow suspicious of calculus in the left kidney pelvis, and wanted a left pyelotomy done for the removal of the stone. A re-ray a few days later showed no stone in the left kidney, but a stone in the left lower ureter. There was complete blocking of this ureter, with intense pain because of back pressure. Two catheters were put in the ureter past the stone and left in for twenty-four hours. This was repeated several times during a period of several weeks, and the patient passed the stone spontaneously.

Case 14.—J. H. Q., aged 60, came because of a number of severe attacks of pain in the right side, shooting towards the bladder. The *x*-ray findings showed both kidneys clearly outlined, and normal in size and position. A large circular shadow 6.5 cm. in diameter with calcium deposit on the edges was seen in the region of the gallbladder. A small shadow 8 mm. long was present in the region of the right uretero-vesical junction. A re-ray with ureter catheter in position shows the catheter in contact with a calculus at the ureteral opening, with obstruction. The cystoscopy shows a swollen ureteral mouth, with obstruction to the catheter.

Case 15.—E. M., aged 30, single, gave a history of abdominal operations for appendicitis, peritoneal adhesions, retroverted uterus and more adhesions, performed various times, and yet she has spells of typical Dietl's crisis. Pyelograms showed both kidneys ptosed. The lower pole of the right kidney was opposite the fourth lumbar interspace; the left opposite the third. The right kidney pelvis and calyces was normally filled. A slight kink appeared at the junction of the kidney pelvis and ureter and a right angled turn of the ureter at the pelvic junction. The left kidney pelvis was filled normally, but a definite kink at the junction of the ureter and kidney pelvis was visible. This ray was taken with the head of the table lowered. This patient had colic occasionally on the right side, but most frequently and more severe on the left side.

Case 16.—Mrs. O. C., aged 40, married, gave a history of having been treated for gallstone colic for over a year. She was referred because of suspected kidney colic. This patient had an alkaline urine, with pus cells 4. *X*-ray showed a calcified area in the region of the bladder, 3 x 6.5 cm., apparently a vesical calculus, and suspicious shadows in the kidneys. Cystoscopy showed the bladder wall to be covered with encrustations, and a large stone as big as a hen's egg. These stones were of a phosphatic type and were taken care of by acid-producing diet.

Case 17.—Mrs. M. A., aged 77, a widow, had had diabetes for years. She had had nocturnal pain in left flank, radiating into abdomen and bladder, which resembled renal colic. This was accompanied by dysuria and frequency which morphia or codein relieved. She also gave a history of recurrent attacks of sciatica on the left side. The urine appeared negative. Roentgenograms of the kidney and spine were made, the plates showing what seemed to be a large bladder stone. It was suggested that this be removed by lithotrite. A few days later, cystoscopy showed no stone in the bladder. A re-ray with cystogram showed this shadow to be posterior and above the bladder. Bimanual examination revealed a nodular uterine hardness. It was suspected that this shadow was caused by a calcareous uterine body, and because of great discomfort from pains requiring morphine for relief, it was decided to do a hysterectomy. This was done under sacral anesthesia, with suprapubic infiltration, and about 20 c.c. of ether for inhalation. The uterus had a body 4 x 3 inches, with a hard calcareous nodule, 4 cm. in diameter.

Case 18.—E. B., aged 30, gave a history of backache for three or four years, repeated attacks of sore throat and slight fever. The urine contained a few pus cells. Attacks suggested kidney stone because of their colicky nature. An *x*-ray showed what appeared to be a calculus in the left ureter opposite the fourth lumbar vertebra, and in order to identify this, cystoscopy and ureteral catheterization was done, showing quite an obstruction several inches up the left ureter. Stereoscopic *x*-ray showed in one plate that this obstruction was exactly at the tip of the ureter. With a history of renal colic and evidence of slight infection in the kidney, one would conclude that this patient had a ureteral stone, obstructing at this point. However, when the picture was put in the stereoscope, it showed that this shadow was at a level posterior to the ureter. In examining the patient's back, it was found that he had a pigmented wart on his back, which was causing the shadow.

THE USE OF CODEINE

In a report by Dr. Carleton Simon to the Louisiana State Board of Health, it is stated that an extremely large quantity of codeine is consumed in Louisiana, but this, Dr. Simon believes, has no connection with addiction. Its use has been largely increased by the reduction in available heroin. In Dr. Simon's opinion, a connection between codeine and drug addiction has not been demonstrated, but the use of codeine may produce a familiarity with the action of narcotics. The use of codeine is held to be objectionable, also, in that it encourages the cultivation of the poppy plant and stimulates the importation of opium into the United States. (Jour. A. M. A., Sept. 11, 1926, p. 853.)

K-17, OR RATTLESNAKE OIL, DEBARRED FROM THE MAILS

The Greene Laboratories (which were not laboratories at all) was a trade name adopted by Cooley H. Greene and his wife, and the business consisted in the advertising and sale through the mails of an alleged cure for deafness called K-17, formerly known as Rattlesnake Oil. The stuff was manufactured by George A. Breon, Kansas City, who, presumably, is the same George A. Breon who comes to the medical profession in the guise of a manufacturer of alleged reputable pharmaceutical products. On April 3, 1926, a fraud order was issued debarring the Greene Laboratories and C. H. Greene from the use of the mails. (Jour. A. M. A., Sept. 18, 1926, p. 959.)

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EDITORIAL

The Physiological Point of View

Clinicians have viewed with great appreciation the tendency of pathologists to come directly into their conferences. This coöperation has helped out immeasurably both of these great medical fields. A better understanding has resulted in a more reasonable nomenclature; each knows the difficulties besetting the other. Pathologists are among the first to agree that studies of form and structure alone do not suffice to determine how either the body or its component organs may function.

Medical schools have not failed to appreciate the great importance of physiology, but up to date this great scientific branch, together with its closely allied associates—chemistry, biology, physics—are entirely too far separated from clinical medicine. This separation is the more lamentable when we consider the amount of time students give to these branches, and the possibilities of progress in medicine if they made what they learned more available.

A glance at our best current medical literature reveals a strong trend toward investigation of capacity and function—leads that classical tissue pathology or bacteriology do not suffice to clarify. Witness the present studies, of considerable importance, of the blood chlorides in maintaining the water balance about the tissue cells—the basis of "Donnen's equilibrium."

In like manner, a number of articles have appeared on the use of novasurol, evidencing the astonishment of the clinicians at its influence in states associated with fluid accumulations in serous cavities. Improvement coming from its use cannot be ascribed to any intimate change within the heart or kidneys—organs supposedly primarily determining diuresis.

Perhaps the University of Paris is right when it takes its first year students directly into the wards. It would seem entirely more logical to study dyspnea or alkalosis from direct contact with a patient who is struggling for his breath, or one with acute dilatation of the stomach from lack of sufficient blood chloride, than to study them as abstract though interesting physiological phenomena.

E. L. T.

Ephedrine

Ephedrine well illustrates the old saying that there is nothing new under the sun, for the therapeutic qualities of this drug have been known for centuries by the Chinese but have only recently been called to the attention of American physicians. The drug promises to be a very valuable adjunct in the treatment of asthma.

Ephedrine is the alkaloidal active principle of a leafless shrub known botanically as *Ephedra equisetina* and the sulphate salt made in the laboratories of the Peking Union Medical College has been tested out clinically in this country. Although its clinical use has been so far rather limited it promises to serve a wide field of usefulness.

Just what happens in the lungs in an attack of asthma is largely a matter of speculation. A turgescence of the membranous lining of the bronchi rather than a spasm of the bronchial musculature probably takes place, this conception obtaining additional support from the prompt relief obtained with epinephrin. A sympathetic

nerve reflex undoubtedly plays a part and there is good reason to believe that specific protein sensitivity plays a rôle at least in some instances.

The characteristics and therapeutic action of this vegetable extract ephedrine closely resemble those of the biological extract epinephrin. Its administration subcutaneously, intramuscularly and intravenously produces much the same response as similar injections of epinephrin. It has the additional advantage, however, in that its effects are more prolonged and are obtained by oral administration.

Applied locally to mucous membranes 1 per cent solutions of ephedrine cause constriction of the capillaries and have proven of value in the symptomatic relief of hay fever sufferers. The use of cocain and epinephrin sprays in this condition has its obvious drawbacks, none of which this new drug seems to possess. Its action is more prolonged and less irritating locally.

A solution of ephedrine when instilled into the conjunctival sac acts as a mydriatic through stimulation of the sympathetic nerve fibers of the iris. It has been used in place of atropin and homatropin and its less prolonged action recommends it in place of the usual mydriatics.

Ephedrine has the additional property of raising blood pressure even when administered orally. Elevated blood pressure, therefore, is a distinct contra-indication for its use and caution should be exercised. Trials have failed to show, however, that the drug will maintain an elevation of blood pressure in conditions such as Addison's disease. Along with the elevation of the blood pressure the pulse is slowed. The central nervous system is sometimes distinctly stimulated and the wakefulness produced at times may be a distinct drawback to its use.

So far, the only preparation of ephedrine on the market is "Fedrin," put out by Eli Lilly and Company. This is ephedrine sulphate containing a small amount of pseudoephedrine (whatever that may be) and is put up in capsules containing 25 and 50 milligrams each. The average dose of the sulphate or hydrochlorid is 1 grain (65 milligrams). One physician reports having given over 200 milligrams in twenty-four hours to twenty patients, three of whom experienced nausea, bladder irritation and headache.

There is reason to believe that the drug may be administered in doses of 25 to 50 milligrams, sufficient to control asthmatic attacks and not enough to elevate blood pressure.

It should be remembered that the drug has as yet had only a limited trial and its acceptance by the Council of Pharmacy awaits more clinical use and further investigation.

X-Ray of the Lungs

Diagnostic *x*-ray of the lungs has been utilized long enough for the pendulum to have swung from the extremes of skepticism and overenthusiasm to its true status.

The older clinicians fifteen years ago were very skeptical of the ability of the fluoroscope to give any additional information over physical examination. With the development of the technic of lung roentgenograms it was thought possible to detect the very early stages of lung tuberculous infection. The roentgenogram came to be considered the final word in the diagnosis or exclusion of pulmonary tuberculosis.

During the influenza epidemic of 1918 and 1919 our eyes were opened to the unreliability of the roentgenogram alone in diagnosing pulmonary tuberculosis. Post-influenzal pneumonia was often found to reproduce exactly the *x*-ray picture of tuberculosis. The mottling which developed during pneumonic resolution could not be distinguished from a tuberculosis. The complete disappearance of abnormal shadows in these cases in time, a result inconceivable in a purely tuberculous lung infection, produced more conservatism in shadow-interpretation.

Those who heard Dr. Rist of Paris during his recent visit to the Twin Cities had their attention called to the frequency of sudden onset of pulmonary tuberculosis. In a series he had studied, onset with sudden febrile reaction and indications of an acute pulmonary infection was obtained in 48 per cent of the cases. In some patients seen early the entire upper lobe was found opaque under the fluoroscope and tubercle bacilli were found in the sputum. It is difficult to conceive of such a high percentage of tuberculous patients with this sort of onset purely tuberculous in origin. We have always felt that the disappearance of shadows in the plates of tuberculous individuals must be the resolution of non-tuberculous lesions accompanying tuberculous infection. Just as an acute broncho-pneumonia can exactly simulate a tuberculous lung lesion and completely disappear, a similar process accompanying a tuberculous lesion could similarly disappear.

Roentgenograms of acute pneumonia have not had the attention they deserve. The observa-

tions by Dr. Rigler which appear in this issue of the journal are, therefore, most interesting. The first appearance of the pneumonic process and its extension can be accurately followed by the *x*-ray and the existence of pneumonia which lasts three days or even one day and which may not present sufficient physical findings for a clinical diagnosis may be absolutely proven by *x*-ray means.

It should be emphasized that *x*-ray studies of the lungs are a laboratory procedure. Roentgenograms are the result of shadows produced by differences in tissue density. Diagnosis of lung conditions based on roentgenograms alone are absolutely unjustifiable and the roentgenogram, while it has clarified our conception of lung processes, must be interpreted along with the clinical history and physical and laboratory findings in any given case.

PROPOSED AMENDMENT TO HARRISON NARCOTIC ACT

A proposed amendment to the Harrison Narcotic Act provides that the Federal government can prescribe and regulate the administration of drugs with narcotic qualities, and as one writer says, "If this precedent is established there is no reason why the federal government cannot prescribe and regulate the administration of anything from bicarbonate of soda to mercury." The Harrison Narcotic Law was passed under the assumption that it would make it impossible for addicts to secure their supply of "dope," and to prevent unprincipled people from making fortunes and fattening upon the infirmities of their fellowmen. As is well known the law has fallen far short of its purpose, and the medical man is harassed at every turn in his efforts to secure narcotics for legitimate purposes. Under the proposed amendment every prescription issued by a physician for a narcotic drug will be subject to review by any pharmacist who may be called upon to fill it. If for any reason the dealer has reason to question the propriety of issuing the prescription he cannot lawfully fill it. In other words, the pharmacist is entrusted with statutory authority to refuse to any sick person medicine that the attending physician has prescribed. The absurdity of the whole proposition would be laughable if it were not dangerous, and the thing for the medical profession to do is to oppose this tampering with the rights and privileges of reputable and licensed physicians in the prescribing of drugs for the alleviation of the sick and suffering.—*J. Indiana M. A.*, August, 1926.

OBITUARY

Dr. John Nelson Risjord

Dr. John Nelson Risjord was born in Telemarken, Norway, December 22, 1863, coming to the United States in 1882, when he located at Mt. Horeb, Wisconsin. The following year he came to Fertile, Minn., where he practiced later, but remained only four years, the first time.

He returned to Norway, where he attended a seminary for a year, then back to Wisconsin, becoming a student at a business college in Madison for two years. After this he, with a partner, edited a newspaper at Mt. Horeb for three years.

Having sold out his interest in the paper he entered the Iowa Medical College, graduating in 1898. After a year of practice in Kenseth, Iowa, he again came to Fertile, this time taking up his work as a practitioner of medicine, which he continued in the same place for twenty-seven years, up to the time of his death, which occurred August 25, 1926.

Four children survive him, one, Miss Minnie, being a teacher at Hibbing. A son is practicing medicine in Chicago.

Dr. Risjord was one of the early settlers of Fertile, and had served his community both as a physician and a public-spirited citizen, having been, at various times, mayor, member of the council, and member of the board of health. He was always interested in the agricultural development of his portion of the state, having acquired considerable farm property during the years of his residence there.

For the twenty-seven years that he lived and worked in the community of Fertile and its environs he was building himself into the structure of the town so that every family, every activity and every institution will be a constant memorial to his faithfulness and industry.

Dr. Norman Barden

Norman Barden was born in Minneapolis, Minn., August 16, 1892. He graduated from East High School and attended the University of Minnesota. He received the degree of Doctor of Medicine from the University of Cincinnati Medical School in June, 1919, and served his interneship in St. Luke's Hospital in St. Paul. After this he engaged in general practice in Minneapolis until the time of his death, which occurred August 18, 1926, at the age of 34.

He was a member of Alpha Kappa Kappa and Alpha Omega Alpha fraternities and of the Hennepin County Medical Association. He was on the staff of St. Barnabas and Asbury Hospitals of Minneapolis.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

STEARNS-BENTON COUNTY MEDICAL SOCIETY

The Stearns-Benton County Medical Society met at Clearwater, Minnesota, Thursday, September 23, 1926, at 6:30 p. m. as the guests of Dr. E. M. Kingsbury of that place.

Dinner was served. After getting the returns of the Dempsey-Tunney fight over the radio the following program was given:

"Varicose Ulcers," Dr. Chas. S. Sutton, St. Cloud.
"Urinary Retention," Dr. W. L. Freeman, St. Cloud.
"Infant Feeding," Dr. W. B. Richards, St. Cloud.
"Post-operative Treatment," Dr. H. W. Goehrs, St. Cloud.

The October meeting was held at Little Falls, Thursday, the twenty-eighth, with the Upper Mississippi Society.

The November meeting will be held at Sauk Center, Nov. 18, 1926.

MINNEAPOLIS SURGICAL SOCIETY

The next meeting of the Minneapolis Surgical Society will be held at 8 p. m., on Thursday, November 11, 1926, at the Minneapolis General Hospital, 6th Avenue South and 5th Street. This meeting will consisf principally of the presentation of the more interesting surgical patients, a brief review of their histories, discussion of the cases, and a presentation of pathological specimens.

All members of the medical profession are cordially invited.

OF GENERAL INTEREST

Dr. R. H. Wald has severed his connection with Armour and Company, South Saint Paul, and is now located at 355 Lowry Building, Saint Paul, Minnesota.

Dr. Dudley W. Palmer of Cincinnati was elected president of the Association of Resident and Ex-resident Physicians of the Mayo Clinic at its eighth annual session held at Rochester, Minnesota, October 6, 1926. Dr. Palmer succeeds Dr. Otis F. Lamson of Seattle.

Other officers named were: Dr. William L. Estes, Jr., South Bethlehem, Pa., first vice president; Dr. James I. Scarborough, Little Rock, Ark., second vice president; Dr. G. J. Thomas, Minneapolis, general secretary, and Dr. R. D. Mussey, Rochester, secretary-treasurer.

Dr. M. S. Henderson was elected to the board of governors, succeeding Dr. D. C. Balfour of Rochester.

New members of the advisory board to fill vacancies left by five whose terms have expired are: Dr. W. C. Carroll, St. Paul; Dr. Ethan Flagg Butler, Sayre, Pa.; Dr. Eric Larson, Woodland, Calif.; Dr. Henry J. McKenna, Kansas City, and Dr. Robert Lee Sanders, to fill the unexpired term of Dr. Fred Rankin of Rochester.

The Mankato Clinic formally opened its new Clinic building, corner Main and Broad Streets, Mankato, Minnesota, Wednesday, Sept. 29, 1926. The Clinic consists of thirteen physicians and surgeons and was organized Jan. 1, 1916. The personnel of the different sections is as follows:

Internal Medicine—H. J. Lloyd, M.D., E. L. Schield, M.D., M. I. Howard, M.D.; Surgery—J. S. Holbrook, M.D., F.A.C.S., A. E. Sohmer, M.D., F.A.C.S., C. J. Holman, M.D., F.A.C.S., W. C. Stillwell, M.D.; Obstetrics and Pediatrics—G. A. Dahl, M.D., R. N. Andrews, M.D., M. I. Howard, M.D.; Eye, Ear, Nose and Throat—V. I. Miller, M.D., J. T. Schlesselman, M.D., E. W. Benham, M.D.; Radiology and Physiotherapy—A. J. Wenworth, M.D.; Orthopedics—J. S. Holbrook, M.D.; Urology—A. E. Sohmer, M.D.; Clinical Pathology—E. L. Schield, M.D.

Dr. Russell O. Lyday, who has been practicing in Brevard, North Carolina, since leaving the Mayo Clinic, Rochester, last spring, is now located in Greensboro, North Carolina.

The Children's Clinic of Minneapolis, which has been located at the Abbott Hospital for the past six years, has dissolved partnership and ceases to exist. Dr. N. O. Pearce and Dr. Rood Taylor have opened offices in the new Yeates building. Dr. F. C. Rodda and Dr. E. F. Robb are contemplating locating, in the near future, in new offices on Lyndale Avenue South, Minneapolis.

NEWS FROM THE MAYO CLINIC BULLETIN

Presentation of Memorial Tablet: The time usually devoted to the meeting of the general staff on Wednesday, September 29, was given over to the presentation of a bronze tablet commemorating Dr. Russell D. Carman, by the American Roentgen Ray Society. The presentation was made by Dr. E. H. Skinner, Kansas City, Chairman of Executive Council of the Society. Short talks were also given by Dr. A. W. Crane, Kalamazoo, and Dr. P. M. Hickey, Professor of Roentgenology, University of Michigan. Responses were made by Dr. W. J. Mayo, Dr. C. H. Mayo, and Dr. L. B. Wilson. Dr. A. B. Moore presided.

Lectures by Dr. Gans: The seminar in histopathology of the skin to be given by Dr. Oscar Gans, Professor of Dermatology and Dermatopathology, University of Heidelberg, began Monday, October 4. During his stay in Rochester Dr. Gans will also give a series of Mayo Foundation lectures.

Dr. J. W. Kernohan and Dr. H. W. Woltman sailed from New York early in October for Italy. They will visit the medical centers of Italy, Germany, and France, on their way to England. Dr. Kernohan will then go to his home near Belfast to remain until the first of next year. Dr. Woltman will spend some time studying in London, and then will return to the Continent for some work at Vienna and other cities which have important neurologic clinics. He will return to Rochester about the first of April.

Dr. William M. deVries, Professor of Pathology, University of Amsterdam, visited the Mayo Clinic for two days during the week of October 3.

Dr. R. Bierich, Director of the Cancer Institute of Hamburg, Germany, and *Dr. Archibald Leitch,* Director of the Cancer Hospital Research Institute, London, visited the Mayo Clinic during the week of October 3.

Dr. Bierich and Dr. Leitch came to this country to attend the International Cancer Symposium given by the American Society for the Control of Cancer at Lake Mohonk, New York, in September.

Meeting of The Mayo Foundation chapter of Sigma Xi: The Mayo Foundation chapter of Sigma Xi met at the Arthur Hotel Monday, October 11, at 6:00 p. m. The speaker of the evening was Dr. Joel Stebbins, Director of the Observatory, University of Wisconsin. His subject was "The Light of the Stars."

New Fellows in The Mayo Foundation: Twenty-nine new Fellows have been admitted to The Mayo Foundation for the quarter beginning October 4, 1926. Sixteen of these Fellows will major in surgery.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry.

H. K. Mulford Company

Digitos

Digitos Ampules, 1 c.c.

Solution Pituitary Extract Surgical-Mulford

Ampules Solution Pituitary Extract Surgical-Mulford, 1 c.c.

Parke, Davis & Company

Ovarian Substance Soluble Extract-P. D. & Co.

Ampules Ovarian Substance Soluble Extract-P. D. & Co., 1 c.c.

E. R. Squibb & Sons

Ipral

Ipral Tablets, 2 grains

United States Radium Corporation

Ampules Radium Chloride, 2 c.c.-United States Radium Corp. (radium element, 50 micrograms)

Ampules Radium Chloride, 2 c.c.-United States Radium Corp. (radium element, 2 micrograms). For Drinking Use

Erysipelas Streptococcus Antitoxin Concentrated-Squibb.—An antitoxic serum (Jour. A. M. A., Aug. 28, 1926, p. 671) prepared according to the method of K. E. Birkhaug under license of the School of Medicine and Dentistry of the University of Rochester. It is standardized so that 1 c.c. will neutralize at least 50,000 skin test doses of a toxin furnished by the licensor. The product is marketed in syringes containing 15 c.c. E. R. Squibb & Sons, New York.

Diphtheria Antitoxin, Purified, Concentrated-Lilly.—A diphtheria antitoxin concentrated (New and Non-official Remedies, 1926, p. 330) marketed in syringe containers of, respectively, 1,000, 3,000, 5,000, 10,000 and 20,000 units each. Eli Lilly & Co., Indianapolis, Ind.

Antistreptococcic Serum-Gilliland.—*An antistreptococcus* serum (New and Non-official Remedies, 1926, p. 339), also marketed in 20 c.c. syringes. The Gilliland Laboratories, Inc., Marietta, Pa.

Poison Oak Extract-Lederle (In Almond Oil).—A solution in almond oil of a substance extracted from the fresh leaves of poison oak (Rhus Diversiloba). It is used to relieve the symptoms of dermatitis due to contact with poison oak. The product is marketed in 1 c.c. syringes. Lederle Antitoxin Laboratories, New York. (Jour. A. M. A., Sept. 4, 1926, p. 757.)

Digitos.—A preparation of water-soluble active principles of digitalis leaves, containing not more than 7 per cent of alcohol. It is standardized so that 1 c.c. is fatal to a 250 gm. guinea-pig. The actions and uses of Digitos are the same as those of other digitalis preparations. It is suited for hypodermic, intramuscular and intravenous administration, but is not adapted for oral administration. Digitos is also marketed in 1 c.c. ampules. H. K. Mulford Co., Philadelphia.

Solution Pituitary Extract Surgical-Mulford.—A slightly acid aqueous solution containing the water-soluble principle or principles of the fresh posterior lobe of the pituitary body of cattle. It has twice the strength of solution of pituitary-U. S. P. X. The actions, uses and dosage of solution of pituitary are discussed in New and Non-official Remedies, 1926, pp. 281-283. The product is supplied in 1 c.c. ampules. H. K. Mulford Co., Philadelphia. (Jour. A. M. A., Sept. 25, 1926, p. 1037.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of September 15, 1926.

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, September 15, 1926, at 8 o'clock. Dinner was served at 7 o'clock.

The meeting was called to order by the President, Dr. H. L. Ulrich. There were 26 members present.

The minutes of the May meeting were read and approved.

Dr. Hynes, Secretary-Treasurer, read the reports of the Secretary and Treasurer for the year 1925 and 1926. These were approved. The Secretary-Treasurer also called the attention of the Academy to the amount in the Fellowship fund and suggested that the Academy work out some plan of offering a prize for original research work or a fellowship to be paid from the income of this fund. The Executive Committee was instructed to work out some plan and present the plan to the Academy for action.

The annual election of officers resulted in the following men being elected for the ensuing year:

President .....Dr. Frank E. Burch, St. Paul
Vice-President.....Dr. John E. Hynes, Minneapolis
Secy.-Treas.....Dr. Carl B. Drake, St. Paul

Dr. Arthur T. Mann (Minneapolis) reported a case of Carcinoma of the Rectum, as follows:

I wish to report the case of a farmer 55 years of age. When he came in he was bronzed and fairly vigorous looking and yet he looked as though he had lost something under his tan. He said he had been perfectly well up to the 12th of July of this year. At that time he began to have a feeling of fullness in his stomach and began to lose the desire for food. He had lost 8 pounds in weight. He had always had two stools a day for years and from two to three stools were his normal. Since July he had begun to have from two to five stools a day. On the 20th of July (8 days after

he was conscious of any trouble) he had a pain in the epigastrium, just beneath the lower margin of the ribs, and went to bed. Hot water bottles and turpentine took care of that attack, but he never felt well after that time. We could get nothing further in his history except that he had a little difficulty with getting his food into his stomach and, as soon as it was there, he felt full. He presented a rounded mass in the right epigastrium which elevated the abdomen about one inch. It was hard and resistant and, while the entire abdomen was tight, I felt I could distinguish an edge which I thought might be the liver. I thought I could get a notch where the notch in the liver ought to be. The patient had no urinary trouble. The prostate was normal in shape and consistency, perhaps a little larger than usual. He complained of feeling very tight.

I put him through the series of *x*-rays with the following results: The swallowed food would stop at the level of the diaphragm; the esophagus filled with the barium and swelled to a size rather larger than normal (shown on film); with certain motions the barium meal would gush over into the stomach, showing that there was no real stricture at the cardia, and the stomach was pushed over to the left. Under the fluoroscope the stomach was seen pushed backwards, as well. The barium meal went through the stomach with the proper amount of speed, when it once was in the stomach. There was pressure from something which was pushing the organs apart in all directions.

(2nd *x*-ray shown.) This condition was always present and the barium was pushed over to the left of the fundus as though a large fist were thrust against it.

The blood count was normal. Hb. 80 per cent, leucocytes normal and white cells normal. The man looked and behaved like one who had something rather seriously wrong with him.

(3rd *x*-ray shown.) The diaphragm was pushed up so that it went up to the seventh rib on the right, posteriorly, and also was high on the left so that it had pushed his heart over out of line.

(4th *x*-ray shown.) The lower margin of the liver shows here a fairly normal line but lower than normal.

The spleen was nearly normal. I thought it was just slightly enlarged to percussion but not enough to call it greatly enlarged, i.e., it extended between the 9th and 12th ribs.

The main prominence was at the place where a cyst of the pancreas does present, but this did not feel like a cyst of the pancreas (it was too hard and its edge rather too definite) so I felt that we had an enlarged liver and not the pancreatic cyst which they were inclined to work out from the *x*-rays.

This man was willing to have anything done that would help him. He was willing to have an operation but I was not sure I wanted to operate because I could not see what an operation would do, unless to establish a diagnosis, so we kept him in the hospital a few days for further study. I examined the prostate again and, by raising him up on my fist, I could get above the prostate and could feel a mass in the region above the prostate and beginning at the top of the prostate. This, I felt, could be from the top of the prostate, or in the cul-de-sac, or, possibly, in the rectum itself. It was a smooth, flattened, truncate mass, broadening upwards and I was unable to reach the top of it. So my diagnosis at that time was "enlarged liver from secondary carcinoma; 75 per cent primary in the rectum and 25 per cent primary in the prostate."

The stools were examined. They were frothy and contained fat, and it seemed as though his pancreas might be at fault. He was given glucose and, two hours after, had 0.18 per cent blood sugar. 0.12 per cent is considered about normal so 0.18 per cent corroborated the notion that possibly the pancreas might be at fault. He started to have diarrhea and I decided no operative interference was justifiable. He rather rapidly lost strength. We had the diarrhea controlled within 24 hours and he felt a little better. We had another examination of the stool after he had been on a fat-free diet and we found it normal. His blood studies throughout were normal and showed none of the changes which might give us an enlarged liver. His weight was 167 pounds; his winter weight had been 175 pounds.

I had never seen a liver so tremendously enlarged from carcinomas as this one that was not nodular so that one could feel the nodules. I came to the conclusion that it was the liver that was pressing the stomach over and not the pancreas, and that explained his stoppage at the diaphragm, i.e., the cardia was pushed over so that it was like a sharply-bent ribbon and closed the esophagus like a valve. At that time I told the family just what I thought the diagnosis was.

The man suddenly got worse and died in the night. We had a postmortem, at which time we found it was carcinoma of the rectum. Here was a man almost gone from carcinoma of the rectum and who had had no symptoms he was conscious of until two months before his death. The liver weighed 5,250 grams, three times the normal. On section it was one mass of small carcinomas (secondary), none of them large, and only small patches of liver substance could be seen. I have never seen such an enormous liver from any other cause than carcinoma. The lumen of the bowel was smooth.

DISCUSSION

DR. HEAD: Was there occult blood in the stools?

DR. MANN: Yes, there was occult blood in the stools persistently, but we did not get the significance of that sufficiently. The increase in the blood sugar, after the administration of the glucose, probably was due to loss of liver function instead of the pancreas. The loss of liver function to a degree sufficient to influence the blood sugar test is so rare that this point is exceedingly interesting.

DR. ULRICH: Dr. Mann mentioned the glucose test as being 0.18 after 2 hours. In liver insufficiency the sugar level in the blood is low. When one takes out the liver the animal dies of hypoglycemia. It is quite possible in such a marked case of liver insufficiency (the liver studded with cancer nodules) that a glucose tolerance test would give one a diabetic curve.

DR. HERBERT JONES (Minneapolis) reported a case and showed *x*-rays of a case of traumatic rupture of the diaphragm.

DISCUSSION

Dr. A. Schwyzer: I have had two cases of traumatic rupture of the diaphragm. One had happened by a tree falling on a man when he was a young fellow. He had had that condition for many years (40 years) and was miserable. At times he had signs of obstruction. Finally he had so much discomfort that it was thought to be gallbladder trouble and the doctor took out his gallbladder. He finally had frequent attacks of intestinal obstruction. That case was operated on by first going into the abdomen. There was no small intestine to be found in the abdomen. We found the stomach and the diaphragm normal. No opening into the chest cavity was seen. We now followed the lower part of the duodenum and saw that from the duodenum the jejunum ran upward underneath the transverse mesocolon into a space behind the stomach. The entire small intestine and a loop of the large gut could be pulled down into the abdomen. *X*-ray pictures had shown that the gut reached to the 2nd rib. After all the intestines were replaced the chest wall was opened and a rent in the diaphragm was found. The gut thus had entered the chest behind the stomach. We had not seen anything abnormal at all when the diaphragm was examined from the abdominal side. A piece of fascia, which we took from the rectus sheath, was sewed over the rent in the diaphragm, which we had closed by interrupted sutures. The operation was about three years ago. The patient, whom I saw this early summer, is all right.

The other case was also traumatic. In the *x*-ray picture the transverse colon was seen to the right of the heart. The patient, who was a woman, had had an injury compressing her abdomen. The transverse colon came from the left over the left edge of the liver, and seemed to have a tendency to return from there even after the diaphragm had been sewed to the base of the ensiform process and the nearby muscular structures of the abdominal wall. Therefore, the left border of the liver, which had a tendency to fall down into the abdomen, was sewed to the corresponding portion of the diaphragm. This patient is also well.

A third case I saw when it was operated upon by Dr. Colvin. It was not of traumatic origin. The stomach was in a small cavity near the hiatus esophageus.

Dr. H. L. Ulrich (Minneapolis) gave the President's Address, entitled "Some Aspects of Hypertension." This was illustrated with numerous lantern slides and charts.

DISCUSSION

Dr. S. M. White: Dr. Ulrich has given us a very instructive and entertaining presentation of the subject. The paper brings out one phase of it which interests us particularly because of the studies made in recent years of the effect of various substances on cell membranes. The work of Green has shown the variability in ease with which the red cells can have the membrane destroyed and the hemoglobin liberated in hemolysis, and he has shown that it is the effect of certain substances on the membrane of the red cell which makes them more friable.

Dr. Ulrich has suggested in his paper that in essential hypertension we may have substances which affect the membrane of the smooth muscle of the walls of the arterioles, rendering them less susceptible to the depressor substances supposed to act by relaxing the arteriolar walls. This hypothesis of Westphal and others is stimulating and interesting because we are beginning to understand some of those principles relating to surface tension function of cell membranes.

New fields are being opened up and it has been instructive to me to get the point of view which Dr. Ulrich presents in this connection because it may explain a certain alteration to emotional influences which appear to occur in hypertension. The lability of blood pressure, dependent on emotional factors, is often increased in the early stages and may become greatly diminished in the later stages of essential hypertension. He suggests a change in the cell and its membrane which alters its response to stimuli.

Dr. J. W. Bell: President Ulrich's paper is a very interesting and instructive one. Essential hypertension is a problem we are all vitally concerned with. We are meeting with it more frequently the last decade and unfortunately in much younger persons.

I was quite surprised the early part of last month, in the case of a young, conscientious teacher, twenty-four years old, to find a systolic pressure of 225. This young, nervous woman was free from evidence of structural disease. Under complete rest and restricted diet, at the end of a fortnight the systolic registered 165 and diastolic 85. She then resumed her school work and yesterday, at the end of two weeks, it again registered 210 systolic.

Hypertension is a serious problem of apparently many angles. Owing to its increased frequency in the younger people, it demands careful consideration.

Dr. A. Schwyzer: I want to ask the Doctor about lecithin. Did you not say that we must know more about the chemistry of lecithin? We know the chemical constitution.

Dr. Ulrich: There is no way of isolating it and estimating it at the present time.

I want to thank Dr. Bell and Dr. White for their discussion of my talk. We have got to find out why these muscle cells (in the precapillary area) change. We talk a lot about worry and the stress of modern life in the production of hypertension, but in the end it is the muscle cells which produce the pressure. Why do they do it? There must be some recognizable factor. I am practically giving Westphal's ideas in my paper and corroborating them in a small way by our work at the General Hospital.

If cholesterin is a factor then we are going back to our old-fashioned ideas about diet. There is no reason why we could not put these people on a nitrogen balanced diet and then keep them there. In cases where there is no hypercholesterinemia such a diet would be of no use.

I think we are approaching, as Dr. White said, a physiological clearness on this, rather than a discussion of doubts. Hormonal factors alone do not explain away the situation. The point I make of fixation of function is new. I have never seen it in literature. It is similar to fixation in the auricle. Fixation of smooth

muscle must be discussed in a broad way. We must learn more about smooth muscle physiology. We must get at the reason for this fixation before we can do anything in prevention and treatment.

The meeting adjourned.

Carl B. Drake, M.D.,
Secretary.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

GYNECOLOGY AND OBSTETRICS

SUPERVISORS:
ARCHIBALD L. McDONALD,
LYCEUM BLDG., DULUTH
L. W. BARRY,
LOWRY BLDG., ST. PAUL

RESEARCHES CONCERNING THE PHYSIOLOGY OF THE HUMAN AMNION: Dr. H. Keiffer, Brussels (Gynecologie et Obstetrique, Vol. XIV, No. 1). The author has noted that during the usual care of the new-born there is a fall in the rectal temperature from 37 degrees Centigrade to 35.5 Centigrade. He believes that hemolytic icterus of the new-born is largely due to this chilling. A series of 60 babies were treated to avoid chilling, being placed immediately in warm bassinets with no preliminary cleansing. There was no instance of hemolytic icterus in the series. It was observed that within eight to twelve hours the vernix caseosa had entirely disappeared and the skin was clear. After due consideration it was concluded that the vernix was actually absorbed through the skin, and that the vernix caseosa may be of value to the fetus and new-born.

After quoting the usual text-book version of the origin of the vernix, as an excretion of the fetal skin, the author introduces his own investigations and conclusions. Microscopic and microchemical studies have convinced him that the vernix caseosa is not formed in the fetal skin but is a product of the amnion cells. The cellular content of the vernix is comprised of desquamated amniotic cells rather than those of the fetal skin. The area of distribution of the vernix on the fetus is characteristic, namely on the back, in the folds of the groin, axillæ, etc., and is not universal, as might be expected if the substance were an excretion of the skin. He concludes that the vernix is essentially a secretion of the amniotic epithelium, and that the fetal skin contributes only a relatively small amount of desquamated epithelium and sebaceous material. He believes that the vernix has a beneficial effect upon the fetus and also upon the new-born, possibly in supplying fats, lipoids, and cholesterides which may play an antihemolytic rôle.

He states that care of the new-born should be limited to treatment of the eyes and tying of the cord, and placing at once in wool blankets with heat to prevent preliminary fall of temperature. In eight to twelve hours the vernix will have been absorbed and the preliminary cleansing may be done. He suggests the use of lanolin as being especially suited to the skin of the new-born.

A. L. McDonald, M.D., F.A.C.S.

EXPERIMENTAL STUDIES ON THE TOXEMIAS OF PREGNANCY: Can Histamine Poisoning be regarded as the Etiological Factor? J. Hofbrauer, Baltimore (American Jour. Obstet. and Gyn., Vol. XIL, No. 2). The author presents findings and conclusions of a series of experiments undertaken to study premature separation of the placenta, but which also have a direct bearing on certain toxemias, pernicious vomiting and eclampsia. The lesions in premature separation of the normally inserted placenta consist of intramuscular hemorrhages leading to a disassociation of muscle fibers, all due to changes in the smaller vessels. This, together with the shock which is out of proportion to the accompanying loss of blood, suggested the picture of experimental histamine poisoning. Because of similar features of placentation, pregnant guinea pigs were used, and the author was able to reproduce the exact pathological picture. Control experiments with histamine-free extracts were negative. In large carnivora, cats, gross changes were reproduced in the muscles similar to those described in the human uterus, by Williams and others. In the carnivora striking changes were found in the liver and kidney which were of interest in connection with hypothesis of a toxic cause of premature separation of the placenta and also in connection with other toxemias, notably pernicious vomiting and eclampsia.

On the basis of the above analogy he points out certain practical applications. Over-distension of the splanchnic vessels induces a condition of shock out of proportion to the amount of blood lost, and the first indication is to overcome the shock by transfusion or infusion of saline, etc. Operative work should be carried out under local anesthesia or nitrous oxide with free administration of oxygen.

Histamine is derived from histidin, a product of intermediate protein metabolism in animal tissues. Very slight deviation may be sufficient to produce poisons of the histamine group. Another series of experiments was conducted to study the effect of small doses of histamine given over a long period of time. They were able to produce characteristic changes in the liver, fatty degeneration and depletion of glycogen, and also degeneration in the kidneys. Some evidence was developed to show that these changes can be prevented or delayed by the simultaneous administration of insulin, and to a less extent by glucose.

While the first effect of histamine is a reduction of

arterial blood-pressure, he demonstrates that continued administration of small amounts causes a rise, either directly, or indirectly through the adrenals, at least under certain conditions. He also cites evidence to show that the blood changes in the several conditions run parallel to alterations in liver function.

On the basis of the author's reasoning he emphasizes the significance of a diminution of oxygen as a cause of tissue degeneration, particularly as regards the liver, and in fact, in relation to the entire chain of events in the toxemias in question. The free administration of oxygen and carbohydrates is therefore advised.

While as yet it has been impossible to positively identify histamine bodies in the blood of eclamptic patients, he refers to some suggestive work by Dr. K. C. Sun in this connection. Hofbauer suggests that such histamine bodies may arise from the breaking down of fetal ectoderm "Synctial Buds" broken off and lost in the maternal tissues. Their effect is more or less counteracted by secretions of the pituitary and adrenal. He presents a very interesting hypothesis and draws a number of valuable practical conclusions, many of which are well supported by clinical experience.

A. L. McDonald, M.D., F.A.C.S.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS

ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

DIGITALIS THERAPY IN CARDIAC DECOMPENSATION IN CHILDREN: A. Wilmot Jacobsen, M.D., and Wilburt C. Davison, M.D. (Amer. Jour. of Diseases of Children, September, 1926). Digitalis is often believed to be ineffectual in the treatment of cardiac disease in children. The most probable explanation for this belief is that the doses commonly used have been too small, for McCullough and Rupe have demonstrated that both normal children and those suffering from heart disease require from 10 to 100 per cent more digitalis per pound of body weight than do adults before electrocardiographic or other signs of digitalization are produced.

The author's criterion of the desired effect of digitalis therapy was a loss of edema, and they considered nausea or a definite slowing of the rate of the heart as indications for stopping the administration of the drug.

When digitalis is given in sufficiently large doses, the loss of edema is accomplished within one week. It is also true that edema will disappear as a result of rest in bed without digitalis, but a long period is often necessary. The physical comfort of all patients is markedly increased by digitalis therapy.

The body weight, exclusive of edema, of the patients in this series varied from 33 to 86 pounds (from 15 to 39 kg.), and the usual initial dosage was 3 grains (0.2 gm.) of the dried leaves in capsules by mouth every four hours for six doses. The administration of digitalis was continued in doses of from 4 to 18 grains per day until nausea appeared. The daily excretion of digitalis in children is probably about 3 grains, as this amount may be given daily for long periods of time to children who have been digitalized without producing nausea or other signs which would indicate an increased accumulation of the drug in the body.

The average net amount required to produce complete digitalization was 0.5 grains per pound of body weight, or twice the quantity which is usually sufficient in adults.

Perhaps the simplest method of administration of digitalis in children is to give, regardless of the patient's age and body weight, 33 grains (0.2 gm.) of the dried leaves in capsules by mouth every six hours until nausea develops (usually after four to eight doses). As soon as nausea or marked slowing of the pulse occurs, the dose of digitalis should be reduced to 1½ grains (0.1 gm.) twice a day. However, should nausea or marked slowing of the pulse develop while this reduced dosage is being given, digitalis should be discontinued and not readministered until one to two days after all symptoms of intoxication have disappeared.

For patients who have been vomiting before digitalis therapy is begun, 30 minims (2 c.c.) of the tincture of digitalis diluted with 1 ounce (30 c.c.) of physiologic sodium chloride may be given by rectum every six hours until the pulse rate is definitely reduced (usually after four to eight doses). The amount should then be decreased to 15 minims (1 c.c.) of the tincture, diluted with 1 ounce (30 c.c.) of physiologic sodium chloride solution twice a day to replace the daily excretion.

This rectal dosage is equivalent to that outlined in the foregoing for oral administration, and the results obtained in patients to whom digitalis has been given by rectum indicate that the drug is equally well absorbed and tolerated.

R. N. Andrews, M.D.

LEAD POISONING IN CHILDREN: Charles F. McKhann, M.D. (Amer. Jour. of Diseases of Children, September, 1926). Lead poisoning is of relatively frequent occurrence in children. In the author's cases it has usually been associated with pica or with perverted appetite, which causes the ingestion of lead paint with resulting symptoms of anemia, abdominal pain, constipation and vomiting. In the more severe cases, encephalitis ensues, which is often confused with tuberculous meningitis or other forms of encephalitis. Unless proper therapeutic measures are promptly instituted, lead encephalitis is highly fatal.

The administration of calcium salts—calcium lactate by mouth and calcium chloride intravenously—has been demonstrated to produce prompt alleviation of symptoms. Our experience has confirmed these observations. However, the patient is subject to recurrences of acute symptoms of lead poisoning unless excretion of the lead

is effected by a deleading process, best accomplished by production of an acidosis, together with a diet low in calcium.

R. N. Andrews, M.D.

MAGNESIUM SULPHATE IN THE TREATMENT OF TETANUS NEONATORUM: Adeline F. Muelchi, M.D. (Amer. Jour. of Diseases of Children, September, 1926). Since the introduction of magnesium sulphate into the treatment of tetanus by Meltzer, numerous case reports have appeared in the literature, showing a decided reduction in mortality.

Bratusch-Marrain has reported a series of thirty-six cases of tetanus neonatorum, which occurred at the Kinderklinik in Graz from 1906 to 1923. These he divided into two groups: those who did not receive magnesium sulphate, and those who received the magnesium sulphate. In the first group were twenty-eight patients, only one of whom lived, giving a mortality rate of 96.5 per cent. In the second group were eight patients, seven of whom received subcutaneous injections of magnesium sulphate, with recovery in four, giving a mortality rate of 50 per cent. Holt gives the mortality rate of tetanus neonatorum as being between 90 and 95 per cent. There can be no question as to the part played by the magnesium sulphate in the second group.

In tetanus, death occurs during a paroxysm from heart-failure or asphyxia, or is due to exhaustion or to starvation. In infants, it is extremely important to keep up the nutrition. Subcutaneous injections of magnesium sulphate bring about enough relaxation to permit the infant to nurse. By reducing the convulsions, the body can in time throw off the combined toxin, and the antitoxin given combine with the free toxin.

The effect of magnesium sulphate in the treatment of tetanus neonatorum is purely symptomatic. It causes the relaxation and control of convulsions which other sedatives have failed to do, thus giving the body an opportunity to combat the disease.

It is valuable in the treatment of tetanus neonatorum, because it makes normal feeding possible and stops the vomiting.

The action apparently is not cumulative, as the dose can be repeated as soon as the effects of the previous dose have worn off.

Dose 0.2 gm. per kilogram of body weight in ten per cent solution.

R. N. Andrews, M.D.

CONCENTRATED FEEDING IN CHILDREN ABOVE THE AGE OF INFANCY: Henry Heiman, M.D., and Philip Cohen, M.D. (Archives of Pediatrics, August, 1926). Concentrated feeding in infancy has proven itself a successful method of feeding in the hands of those versed in its usage. Gains in weight have thus been obtained in babies which could not have been effected by the ordinary diluted milk formulæ with a caloric value less than that of cow's milk; that is, less than 20 calories to the ounce.

A mixture of about 20 calories to the ounce is normally concentrated; and formulæ with a fuel equivalent greater than 20 calories per ounce are concentrated.

At Mount Sinai Hospital, Schick, with the aid of the dietetic staff, has worked out a system of concentrated foods, where every article of food served is enriched to double the value of cow's milk; that is, 40 calories to the ounce. Thus an article of food like spinach, which is a useful adjunct to a child's diet, is practically devoid of caloric value as ordinarily served, yet when enriched with a sauce of cream, butter, sugar, and flour, will yield one hundred calories or so.

By concentrating every article of food in our concentrated diet; by the selection of foods of naturally high caloric value, the fats or foods rich in fats, like cream, sweet or sour, or foods purely carbohydrate, like sugars, or rich in carbohydrate, like bread and crackers; by recommending the vegetables and fruits of greatest caloric value, like plums, prunes, bananas, potatoes, peas, beans, olives, the authors were able to obtain in many cases a food ratio of about two calories per gram, on about twice the normal concentration.

All foods of the older child can be concentrated as the milk formulæ and cereals have been for infants. This concentrated diet is of great benefit to children with inherently poor appetite and limited food intake, the child with excessive caloric needs due to an inborn metabolic aberration, and to the overactive child, whose appetite is sated with a normal or subnormal volume of food. The nutritional status of these types of children have been improved in 50 per cent of the cases, which is better than previous methods achieved.

R. N. Andrews, M.D.

ROENTGENOLOGY

SUPERVISORS:
LEO G. RIGLER,
MPLS. GEN'L HOSPITAL, MINNEAPOLIS
A. U. DESJARDINS,
MAYO CLINIC, ROCHESTER

VERTEBRAL EPIPHYSITIS: Buchman (Jour. B. & J. Surg., Oct., 1925). This disease entity was first described by Andre Delahaye in 1924, at which time he reported 3 cases, in all of which the superior and inferior epiphyseal areas of ossification of the vertebral bodies show anomalies of location, form, and tenderness, without gross deformities. Buchman's study attempts to establish a relationship between abnormal changes in the superior and inferior vertebral epiphyses and the acquired deformities of adolescence.

The author observes that, normally, the superior and inferior vertebral epiphyses appear at about eleven and one-half years of age. Any gross deviation from their time or order of appearance, the presence of tenderness, and abnormal *x*-ray findings are pathologic. The pathologic *x*-ray findings are: The epiphyses become enlarged, moth eaten, frayed, and indistinct, the vertebral spaces become cloudy, mottled, and irregular; the vertebral outlines becomes indistinct; all of these parts

then tend to fuse into one indistinguishable mass. This is followed by the stage of regression, in which the process is reversed. These characteristic appearances are found in a disease entity, occurring between the ages of ten and twenty-one, and characterized clinically by sensation of fatigue, backache, and tenderness of epiphyses. Many of these cases develop deformities of the spine.

The etiology is unknown. It is thought to be a very low grade infection in the spine. The condition is analogous to Legg-Perthes' disease, Osgood-Schlatter's disease, Koehler's disease, and similar conditions, and forms part of a greater entity: Multiple Epiphysitis of Adolescence.

WALTER H. UDE, M.D.

THE DUODENAL NICHE: Carman & Sutherland (Am. Jour. Roent., Aug., 1926). The literature is briefly reviewed, showing the variance among different observers in the incidence of the niches. This variance is due evidently to differing conceptions of what constitutes the true niche. Another factor is the variation in the class of patients sent for roentgenologic examination, in some clinics there being a majority of frank old ulcer cases, while other clinics have a large proportion of patients with vague abdominal complaints in whom the demonstration of the duodenal niche would be rare.

An analysis is made of a series of 1,658 cases of duodenal ulcer observed at the Mayo Clinic during the year 1925, in which niches were seen in only 220, or 13.27 per cent. Surgical investigation was carried out in 100 of the 220 cases, and ulcers were found in 98, in the other two cases the duodenum being unopened because of the coexisting disease of the gallbladder.

The authors emphasize the importance of the niche as a diagnostic finding, and publish a series of figures illustrating that a considerable proportion of the ulcers would not have been discovered without this sign. A number of these show bulbs which were practically normal roentgenographically, but revealed niches roentgenoscopically which were found at operation.

WALTER H. UDE, M.D.

NUMOQUIN NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Numoquin is the proprietary, non-descriptive, therapeutically suggestive name under which Merck & Co. markets ethylhydrocupreine. Ethylhydrocupreine is a synthetic derivative of cupreine, an alkaloid occurring together with quinine in cuprea bark. The Council reports that ethylhydrocupreine has the antimalarial and anesthetic action of quinine, but that toxic symptoms are more liable to occur. Merck & Co. advertise Numoquin for use in the treatment of pneumonia. The evidence for this recommendation is practically of no value. The Council found Numoquin unacceptable for New and Non-official Remedies because the drug is marketed with unwarranted therapeutic claims and under a name that is therapeutically suggestive. (Jour. A. M. A., Sept. 25, 1926, p. 1055.)

EYE, EAR, NOSE AND THROAT

SUPERVISORS:

VIRGIL J. SCHWARTZ,
PHYS. & SURG. BLDG., MINNEAPOLIS

E. L. ARMSTRONG,
FIDELITY BLDG., DULUTH

SOME OF THE MORE DIFFICULT PROBLEMS IN THE MANAGEMENT OF PTERYGIA: J. O. McReynolds, Jackson Birthday Volume. Irritating atmospheric conditions, such as heat, dust and high winds, are the chief cause of a thickening of the bulbar conjunctiva in the interpalpebral fissure, encroaching on the cornea. These conditions must be avoided afterward to prevent recurrences. When these latter do occur, especially if repeatedly, the prognosis becomes steadily worse due to the large amount of scar tissue, and we must now deal with a keloid or a symblepharon, at times causing limitation of ocular movement and double vision.

Ordinary operative methods will not suffice in such cases. In moderately scarred cases the conjunctiva must be dissected up carefully from the subjacent cicatrix and saved so far as possible. The scar tissue is then completely removed from the sclera and cornea, thus giving the eyeball free motion, taking care not to injure the medial rectus. The conjunctiva is then sutured over and directly to the denuded sclera to obtain firm adhesion between these two. In this way vessels from the caruncle to the cornea are obliterated.

If there is a great amount of scarring and less available conjunctiva, a graft from another person's conjunctiva or from the epithelium on the inner surface of the arm may be used to cover the sclera. Rarely there is so much scarring and so little conjunctiva that operation is not indicated.

Of possible complications, corneal ulcer might be thought common, yet it is actually rarely seen. Careful preoperative preparation, the use of other local anesthetics than cocaine, local heat, and miotics to prevent corneal stasis, will help prevent further complication. In old people, glaucoma has occurred, following the prolonged use of cocaine. Iritis and cyclitis, following a keratitis, have occasionally been seen. Mild, subconjunctival suppuration in the anterior part of the eyeball, near the stitch, may sometimes take place; prompt removal of the suture, incision, hot applications and local antiseptics always effect a quick recovery.

A pterygium which is advancing rapidly or is vascular ("pterygium crassum") should be given a guarded prognosis unless the conditions which brought it on can be obviated. Elimination of the underlying causes is the important thing. With the thin, stationary, nonvascular type the prognosis is very favorable.

VIRGIL J. SCHWARTZ, M.D.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

THE TREATMENT OF FRACTURES: WITH NOTES UPON A FEW COMMON DISLOCATIONS. Charles L. Scudder, M.D., Consulting Surgeon to the Massachusetts General Hospital, formerly Assistant Professor of Surgery at the Harvard Medical School. Tenth edition, revised. 1,240 pages. Illus. Cloth, $12.00. Philadelphia and London: W. B. Saunders Company, 1926.

PRACTICAL HELPS IN THE STUDY AND TREATMENT OF HEAD INJURIES. Adolph M. Hanson, M.D., formerly neurosurgeon to Evacuation Hospital No. 8, A. E. F. 109 pages. Illus. Cloth, $3.00. Boston: Richard G. Badger, The Gorham Press, 1926.

A PRACTICE OF PHYSIOTHERAPY. C. M. Sampson, M.D., formerly of the Physiotherapy Service, Walter Reed U. S. Army General Hospital, Washington, D. C., etc. 620 pages. Illus. Cloth, $10.00. St. Louis: C. V. Mosby Company, 1926.

THE SURGICAL TREATMENT OF GOITER. Willard Bartlett, A.B., M.D., D.Sc., F.A.C.S. Foreword by Dr. Charles H. Mayo. 365 pages. Illus. Cloth, $8.50. St. Louis: C. V. Mosby, 1926.

GOITER AND OTHER DISEASES OF THE THYROID GLAND. Arnold S. Jackson, M.D. 401 pages. Illus. Cloth, $10.00. New York: Paul B. Hoeber, Inc., 1926.

DEFECTIVE MEMORY, ABSENTMINDEDNESS, AND THEIR TREATMENT. Arnold Lorand, M.D., Carlsbad, Czechoslovakia. 340 pages. Cloth, $3.00. Philadelphia: F. A. Davis Company, 1926.

PRACTICAL DIETETICS FOR ADULTS AND CHILDREN IN HEALTH AND DISEASE. Sanford Blum, A.B., M.S., M.D., Head of Department of Pediatrics and Director of the Research Laboratories, San Francisco Polyclinic and Postgraduate School. 2nd revised edition. 362 pages. Cloth, $4.00. Philadelphia: F. A. Davis Company, 1926.

THE TREATMENT OF KIDNEY DISEASES AND HIGH BLOOD PRESSURE. Part I. Frederick M. Allen, M.D. 210 pages. Morristown, N. J.: The Physiatric Institute, 1925.

Summarizing the theme and motive of this work in the preface, Dr. Allen presents the essential disturbances of renal-vascular disease, namely, nitrogen retention, edema and hypertension, and their most important remedies, protein and salt restriction. Briefly, and concisely, yet comprehensively, the author discusses the present status of renal-vascular disease as it particularly concerns the kidneys, and emphasizes the fact that this is not an inevitably progressive condition, but one for which much may be done by proper therapy, particularly dietary. Great stress is laid on the benefits to be obtained from the use of the low salt and low protein diets, scientifically and accurately regulated, the poor results with their use by some men being attributed to insufficient or too great restriction of these food elements.

Recognizing the difficulties associated with dietary regulation, the author goes carefully into the problems of food selection, especially variety and palatability, and sample diet lists are given which have proven successful in his hands.

The author advocates the use of the low salt diet in hypertension and edema, and of the low protein diet in cases with nitrogen retention as indicated by high blood urea content, based on a carefully controlled use of these measures over a period of six years. Recognizing the opposition to these measures recorded by able medical men, Dr. Allen still feels that they are destined to revolutionize the treatment of hypertension, and, if he is mistaken, is prepared to bear the consequences.

The reviewer feels that the work is a valuable contribution toward clarifying the status and understanding of renal-vascular disease, with the able presentation of a rational method of treatment, well worth the consideration of every practitioner of medicine.

JOSEPH M. BORG, M.D.

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MINNESOTA MEDICINE

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THE PROFESSION*

Charles P. Emerson, M.D.
Dean of the Indiana Medical College
Indianapolis

Mr. Toastmaster and ladies and gentlemen: Never was I under greater responsibility: that imposed by the title which you have given me, to which none of us can do credit, and this introduction which increases manifold my obligations.

"Our Profession," the first historically of all the professions, and, still, we believe, the noblest of them all; our profession, the same from beginning and yet ever changing. Like a stream which begins in the wilderness as a small trickling brook and which gradually gains in volume, now a raging torrent, now spreading out into marshes where malaria abounds, now again gathering itself together as a stream which gives power and health to the community, so our profession from the beginning of history has been ever the same, and yet ever changing, one continuous stream of thought which has flowed to us down through the ages.

You say, "Oh, that is not true, the medical profession has never had its torrents." Has it not? Look over your patients for scars of operations no longer performed, *e.g.,* those for the suspension of various internal organs, for the shortcircuiting of various parts of the bowel; you men of internal medicine, look over your shelves for the bottles of the different vaccines that you gave years ago and do not now. Haven't we had our enthusiastic short-lived fads? Haven't we had our mental torrents? May we have no more of them.

You say, "Oh, but medical thought has never become stagnant like a marsh." Oh yes it has, and it is those stagnant marshes which are my subject to night. First of all, there have been periods of stagnation due to theology. Do not misunderstand me. I am a Presbyterian elder, and of this I am proud, but I recognize that the influence of religion on medicine has at certain periods been one of which I am not proud. We shall not dwell at length on the history of medicine, you would not be willing to listen to that, but we would refer to the medicine of Egypt which was good until the priests got political power, and then died because priests combined medicine and theology into one dogmatic system. We would mention the Jews, who had no medicine because they believed that all physical diseases were due to sin, hence the obvious conclusion in the presence of sickness was "repent and sin no more." This was the theology and the medicine also of the old Puritan days, and even of my own boyhood days, for the Puritans taught that all disease was due to sin, and that the man who by medical means sought to relieve sickness was a coward trying to escape a well merited punishment. Surely where such belief abounds medicine will stagnate.

It is only too true that in the past all relationships between theology and medicine have proven disastrous for medicine. Why do I emphasize this? Let me again call attention to the fact that there is nothing that I would less willingly do than in any way to throw a slander on religious organizations; nevertheless we doctors *must* enter more into the religious lives of our patients for there abides one of the most potent of therapeutic agencies. How can we of the medical profession get control of that therapeutic power which abides in their spiritual life? This we cannot afford to overlook any more than we can afford to disregard modern surgery, roentgenology, or radium. Indeed the next great problem before the medical profession is to control spiritual forces with some degree of accuracy.

Our plea is not that doctors should get a little more pious. The fact is that research work in the laboratories of so-called cold-blooded science has brought us face to face with the conclusion that just as a man's mental health and physical

*Banquet address at the annual meeting of the Minnesota State Medical Association, St. Paul, May, 1926.

health, formerly held to be separate, prove to be one and the same, so now we see that a man's spiritual life, his mental life, and his physical life are inseparable, and that further progress demands that we develop them all together.

Oh yes, there have, historically, been great marshes, great and stagnant marshes, along the stream of medical thought and some of these mark the periods when the church got control of medicine. How now may we enter this field and yet avoid a dogmatizing theology?

Then there were other great stagnant marshes along the course of the stream of medical progress which were produced by law. You may remember the great lawmaker of Babylon, Hammurabi. Before his day Babylon had a medical profession while centuries later it had none. We know that his laws governing medical practice were far too definite and it is quite possible that they in part at least killed medicine. You may remember that, later, Herodotus visited that great country and summed up the situation with the brief words, "For there are no doctors there."

Don't misunderstand me. I congratulate you on your interest in the different laws which now engage your attention. I certainly would not imply that there should be no medical legislation, but would say that the practicing profession should not seek any protection for itself through legislation. The public should be protected and doctors certainly should take it upon themselves to see that all public health legislation is right, but please remember that medicine, to be good and accurate, to be as beneficial as possible for our patients, must be the product of an evolution that flows on freely without any impediment, and he who makes shackles for others only forges fetters for himself. Of course we must have medical practice acts which will guarantee to patients physicians who are honorable and well trained, but they must not in any way define how doctors shall treat disease. We should fight every law which dictates or hampers us in our work, but we also should refuse to accept any legislation which seems to favor the medicine of today, because it will only hamper the medicine of tomorrow.

Law has, in the past, made medicine stagnant. May it never again in the future.

Oh yes, there have been stagnant marshes in the evolution of medicine, but there also have been periods when the stream ran very pure, even purer than today, and of one of these periods, that of Greek medicine, we would for a moment speak.

Don't get frightened; I am not going to talk much ancient history, but we Americans boast that we are the Greeks of modern times. I certainly hope we are, because theirs was an example worth our attention.

One reason why the Greeks were able to produce a medicine of such pure quality may be that Greece was a country so divided into small districts by mountains that no priesthood as well as no politician ever could unite the Greeks on one single policy. One result was that the medicine of Greece was able to develop free from the shackles of theology and of law, and so became a stream of pure thought.

We sometimes say that the Greeks were a race of geniuses. We recognize that the art of the Greeks is the best that we have; that the philosophy of Greece is the source of modern philosophy; that the literature of Greece is the example of the ages; and yet the Greeks were not a race of geniuses. Indeed there never was a Greek race. There was a Greek nation, yes, but it was made up of so many different races from all parts of Europe, Asia and Africa, mingled together, that the Greeks have been called the "splendid mongrels" of history. How then if there was no Greek race and no pure Greek blood could such geniuses arise. Because they had a culture which encouraged the best that there was in every man; because they gave each man a chance to develop the best that there was in him, and they made a market for the best that he could produce. With no inheritance of genius, with no great racial ability, only a mongrel race, yet it was able to produce the finest in art, literature, philosophy and medicine, chiefly because it created a market for the best that was in man.

Oh men of Minnesota, oh physicians of America, demand the best that is in every doctor, demand the best that there is in our universities, demand the best that there is in our state medical societies. We may have to work harder to keep up with the stream of progress which this would create, but let us demand the finest. Let no jealousy disturb us. Let us make a market for the best there is in medicine. Let us jealously defend the best in medicine. If we develop a market for the finest, highest quality in medicine, then shall we really be the Greeks of the modern day.

But the danger of periods of stagnation in the progress of medicine is not past. We have suffered from the dogma of theology and the dogma of law but the great danger of the dogma of misapplied science is before us. American medicine is now living in a rather dangerous period of history, a period in which the medicine of France and of England has become replaced for a while by the laboratory medicine of Central Europe, where it bore splendid fruit, but, which, like an exotic plant, has not prospered on American soil. What are the results? One is illustrated by a meeting which the American Medical Association called together last winter and asked, "Why can't we have periodic examinations of the apparently well?" And an absurd conclusion was reached that medical schools should give special courses on the examination of the well, since "that is quite different from the examination of the sick." That is, that doctors can't view a patient unless through the spectacles of X-ray plates, Wassermann tubes or microscopes.

Of course laboratory methods are an indispensable help but they cannot make our diagnosis for us. They are indeed valuable in direct proportion as our personal physical examinations into the history and physical condition of the patient are accurate. This is the backbone of medicine and this spine we are weakening. This we should not do. Medicine has, from the very beginning of its history, had one quality, and that is self-sacrificing service for suffering fellowman, and medicine has won success through one method only, and this is to enter sympathetically in the problems of the patient, to try to understand what his problems are, to confirm our suspicions by proper laboratory methods, and then to try to help him. The medicine of the future has, among many, one method necessary to its success, and that is to focus all of its laboratories onto the problem of the patient, and not to ask the patient to solve the problem of the laboratories. A reform is necessary and this reform will involve certain radical reorganizations of our methods. One of these is due attention to environmental medicine.

William Osler in looking over his clinic one day said, "What a pity, what a pity! Here are about forty persons here this morning and we can't help more than three out of ten." One assistant asked, "Why not?"

"Because we are not equipped to help the other seven, since their problem is social, industrial, etc., but not primarily physical."

There were certain men there who had indigestion, *i.e.*, abdominal pains, nausea, vomiting, gas, acid, and the rest. If they needed medicine they got it; if they needed a surgical operation, they got it; but if after three days of *x*-ray work, laboratory study and gastric-juice analysis the conclusion was that the wife couldn't cook or that the patient was so worried that he couldn't digest his food, we dodged the issue. It is, however, just as much our moral obligation to teach that wife how to cook, to relieve that worry, etc., as to give medicine or perform operations. It is, granted that we are honest in our desire to cure the man whom we accept as a patient. They don't know, and we don't know at first, what the matter with them is. They trust that we will find out, and we usually do. We don't at first know, and they don't know, what the therapy should be in order that they may be relieved. Are we intellectually honest enough to do all we can to help them? I haven't been; you haven't been. We were willing to give them the surgery if they needed it; we were willing to give them the medicine if they needed it; but we have not been willing to enter into their social or spiritual life if that is what they needed. And yet here are the patients and here is the problem. They present it to us; we accept it. If as a result of all of our *x*-ray work, all of our laboratory work, we find it is worry or social maladjustment, are we willing to go into their social life, to enter their emotional life?

Again may I call your attention to the fact that that is not any new, theoretical, rather idealistic point of view. It is the result of research work in laboratories and clinics. We must enter more into the social and industrial life of our patients if we really intend to help them, if we really intend to do the best we can for them. To meet those troubles with which the patient comes, if we really are trying to be honest, we will have to develop a social and a spiritual organization in our hospitals, in our offices. So that we may do what? Merely cure the man of the trouble with which he comes and which now we are treating by medicines and surgery, meanwhile drawing a line at anything else, however necessary?

Medicine, like a stream, has started with small clear rivers up in the mountains and then has

flowed down through many countries, through many ages. What the future holds for us we do not know; but God bless the medical profession, and may it remain the profession which will do its level best to solve each new problem presented to it.

UNQUALIFIED PRACTICE IN GERMANY

The medical department has published statistics on the number of unqualified persons engaged in medical practice. Their number could be ascertained with accuracy, as according to law they must be registered by the authorities for reasons of control and taxation. Their number rose from 5,063 in 1923 to 5,648 in 1924, being an increase of 11 per cent. Their clientele is largely composed of members of educated classes and they are consulted often for financial reasons, as they are believed to charge less than a qualified medical practitioner. Also the predilection for mysticism prevailing since the war, together with frequent advertising (not allowed to the medical profession), has aided to make unqualified practice popular. The report stated that 300 unqualified people were prosecuted, of whom 200 were punished; 47 prosecutions concerned the prescribing of drugs reserved to the medical profession; 43 were for artificial abortion; 33 for practice without fixed residence; 36 for offences against registration regulations; 27 for using a title similar to that used by qualified medical men; 24 for causing injury by neglect; 8 for causing death by neglect; 19 for indecent advertistments; 7 for unfair competition; 6 for libels on medical men; 3 for offenses against public morals. The complaints were mostly lodged on behalf of the Society for Combating Unqualified Practice.—The Lancet (London), June 26, 1926.

HARROWER'S ORGANOTHERAPEUTIC INDICATOR

To advertise its pluriglandular products, the Harrower Laboratory uses a device containing an "indicator" in the form of an arrowhead, the shaft of which is a slot in a disk, superimposed on a larger disk. Around the edge of the larger disk are the names of some seventy diseases or disease conditions. When the arrow is rotated to point to any one of these names, one or two numbers become visible through the slot: these refer to the list of "pluriglandular formulas" on the back of the disk. Each condition has its appropriate (?) formula. The Council on Pharmacy and Chemistry has reported on a number of Harrower gland mixtures, pointing out the lack of evidence for their efficiency when given by mouth and also the irrationality of prescribing mixtures that resemble those of the old fashioned shotgun nostrums. The fact that it is apparently profitable for the Harrower Laboratory, Inc., to send out such advertising as that described, is a sad reflection on those physicians who allow themselves to be influenced by "literature" that is sent out by commercial houses. (Jour. A. M. A., Oct. 16, 1926, p. 1322.)

CONGENITAL CLEFT LIP AND PALATE; A SERIES OF CONGENITAL CLEFTS*

HARRY P. RITCHIE, M.D.
Saint Paul

In the few years of my interest in this subject I have found that there are two phases of the subject which overshadow all others in general interest. No matter what part of the problem is under discussion two questions always arise. Couched in the phraseology most frequently used, the two are: "When do you do these things?" and "How many operations are necessary?" The questions are important to those of us who assume the responsibility of repair, to the practitioner who advises patients of proper procedure, but more than all else are important to the people themselves. It requires no elaborate statement or proof to impress upon anyone the consternation and horror that parents of these deformed newborns suffer, not only at their own misfortune but in their concern for the child and its future. Beyond the feelings of love and sentiment the economic aspect looms large.

The two problems expressed in the questions early arose in my work. To solve them the literature was closely studied, to find a great variance of opinion, not only as to the time and number of operations but also as to their sequence. Ideas as to the time question varied from early infancy to maturity, sometimes specific as to lip and palate, sometimes uncertain in expression. The number and sequence discussion led to a situation rather peculiar to this field of surgery: a controversy often phrased in terms so extreme as to bring up the question of the value of it all to scientific progress. At first I thought that much of the controversy was due to personal reasons; support of a special operation, interpretation of a surgical principle, confusion of terminology. Soon I found myself admitting one phase, deprecating another. In other words I entered into the controversy, but soon decided that the situation resulted from no fault of the individual but was definitely fundamental due to the conception of the general

*Read before the annual meeting of the Northern Minnesota Medical Association, Crookston, August 9 and 10, 1926.

subject upon which the wonderful literature has been built.

With these things in mind, Dr. John Staige Davis and I, at the St. Louis meeting of the American Medical Association, offered another point of view in the belief that if there were to be any logical conclusions in this field a change of approach was necessary. The literature has been formed upon the original idea—a dual point of view indicated by the title "harelip" and "cleft palate." The change suggested is that we rediscuss the various problems on the basis of a series of congenital clefts. Any cleft in this location is the result of failure in the same embryonal process of closure, therefore no cleft is more important than another unless it appears so in a given case. The essential of this plan is that the complete palate of the literature of the last hundred years is now resolved into its component clefts, and the term "harelip," which so many writers have recognized as an inapt, unscientific term, is erased. This plan is to be used for the purpose of exactly describing each cleft separately because in no other way can the exact arrangement of the tissues be recognized and recorded.



A photograph of the lip and cast of the same case. This combination of clefts is the most frequent in incidence. It is to be studied as a series of clefts—the lip, alveolar process, hard and soft palate—each one independent of the others.

Analysis of the series reveals that each cleft involves different tissues, requiring different principles and efforts in its repair, that is, each is an entirely different operation.

Take the lip. This involves consideration of the muscle, skin, and mucous membrane, tissues with which we are dealing in all parts of the body irrespective of age, and so here from a purely technical standpoint these tissues can be repaired at any time of life.

Take the alveolar process cleft. This cleft involves the process of the superior maxilla and is the most evident index of the malposition of this great bone. Bone because of its structure presents an entirely different operative problem from that of soft tissue. Experience has shown that in many cases this bone of the face is still soft and pliable at birth and that by pressure will permit of a wide excursion of position. Experience has also shown that this bone may be nearly fixed at birth; also a short time after birth may become so set in its cleft position that it cannot be moved except by slow and tedious process or by fracture. If this observation is true then it becomes a reasonable conclusion that any baby with an alveolar process cleft must have something done to close this cleft at the earliest moment compatible with the condition of the child.

Take the hard palate cleft. This appears in the literature in some instances as a bone problem and has been approached as such. But the quite constant position of the palatal process is one of varying degrees of obliquity. Were these palates always in line, then lateral pressure would lead to proper contact, but since this is not so, lateral pressure quite often increases the deformity, and ends in the high arched palate so frequently seen where this principle has been used. I believe that the repair of the hard palate cleft from the viewpoint of bone carries too great a penalty, and that the muco-periosteal flap or, as Brown has recently suggested, a muco-periosteal-osteal flap aspect is the proper one. When we get into the flap field in this location or indeed in plastic surgery elsewhere in the body we

have a great variety of forms—turnover flaps pedicle flaps, sliding flaps, septal flaps—in various situations and extent. It is this wide choice of forms that has yielded so many so-called palate operations. When we study this muco-periosteal covering of the palatal process in the newborn it appears as a thin delicate structure, almost transparent in appearance. The expectation that it will early stand the quite severe traumatism of elevation and suture with perfect healing, exceeds greatly in my idea and experience the possibilities of this tissue. In spite of this, operators have been influenced by the expressions, palate first or palate early, to attack this tissue at a time when failure is surely invited. I believe that the baby must be well grown and developed, seldom under a year, preferably much older, before an attempt shall be made to close this cleft.

Take the soft palate cleft. This is an operation very similar to the lip, involving mucous membrane and depending for its function on the exact union of the muscle tissue. But it differs from the lip in its location, and lies in a position where it is constantly exposed to irritation from food, act of crying, etc. This tissue must be well developed before it should be attacked. I have placed it along with the hard palate in time, because so often it is possible to do both operations at one sitting.

Now we are in position to answer the proposed questions. Any baby with the cleft of lip, process, hard palate, soft palate, that is, with all the clefts present, requires a separate operation for such cleft. What operation or combination of operations is to be done at one sitting is entirely within the choice of the operator. The only cleft that requires early and prompt repair is the alveolar process cleft, because the longer it is left and the older the baby the more difficult it is to close.

What we are teaching our students now is: Examine the baby, not as a harelip and palate case, but to determine how many clefts are present and which is the most important. Never mind the lip and palate but find whether the process is cleft or normal. If it is normal then time of operation is unimportant; if it is cleft then something should be done to the process as early as possible.

To my mind this answers the question whether to do the lip or the palate first. The answer is you do neither first, but rather the alveolar process first. The importance of the condition of the alveolar process was recognized by us and made the foundation of the classification wherein all cases fall readily into three groups, giving us the wonderful opportunity of studying our cases by subdivision of these groups into form and degree.

In conclusion, the number of clefts present determines the number of operations. The only cleft requiring early closure is the alveolar process cleft. However, my experience indicates that no cleft or combination of clefts shall be considered an emergency situation. A very satisfactory mortality record, I credit not to any expert work on my part but to the appreciation that no baby shall be operated upon until it is passed by a pediatrician and is well established in feeding and distinctly on the gain. To this fact is added the equally important one, that the hard and soft palate operations are never early but always late procedures.

POTASSIUM CHLORATE TABLETS

The saturated solution of potassium chlorate has been much used as a mouth wash in stomatitis. It is also employed as a gargle in the treatment of pharyngitis. Its value in these conditions is, however, uncertain. Holding tablets of potassium chlorate in the mouth gives a more thorough medication and probably does no harm if one tablet is used at intervals of an hour or two. The internal use of potassium chlorate is no longer recommended. Large doses are actively poisonous. (Jour. A. M. A., Oct. 16, 1926, p. 1323.)

VACCINE TREATMENT OF COLDS

It is not definitely known whether or not a cold is the result of a specific infectious process. The prophylactic as well as the curative value of vaccine therapy in this condition is therefore quite problematic. What we know about the nature of the affliction makes it highly improbable that much good can be accomplished by means of vaccine, and clinical experience seems to substantiate these deductions. (Jour. A. M. A., Oct. 23, 1926, p. 1412.)

THE MANAGEMENT OF PATIENTS WITH GOITER*

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In this portion of the United States one is so frequently consulted by patients for advice in regard to a goiter that I thought it might be of interest to review the common types of goiter seen clinically and to discuss the treatment which seems indicated in these types.

So many and such complicated classifications have been suggested for goiters that they have tended to confuse physicians who see only a few patients each year with a goiter. For some years we have followed the idea of Dr. H. S. Plummer as to the different types of goiter seen and I feel that the classification which he uses is the simplest and the most accurate that has been suggested. He feels that we see three common clear-cut types of goiter—colloid goiter, adenomatous goiter and exophthalmic goiter—and that nearly all patients with goiter have one of these three types or a mixture of these types. We do see some of the rarer thyroid diseases, such as thyroiditis, carcinoma, tuberculosis, etc., but they occur so infrequently that I will not consider them in this discussion.

COLLOID GOITER

Colloid goiter occurs in young individuals and is not associated with hyperthyroidism. The entire gland is involved in the process and a symmetrical, "butterfly type" of enlargement of the thyroid gland occurs. The enlargement in such cases may be so slight as to produce only a fullness in the neck, while again it may produce a large goiter. The gland upon being palpated has a soft, granular feel and lacks the hardness usually seen in exophthalmic goiter and the irregular nodules found in adenomatous goiter. Some patients with colloid goiter become nervous over the presence of the goiter and may also show an increase in pulse rate but when such patients have been placed in bed for a few days the metabolic rate will usually be found to be about normal. If the metabolic rate persists above normal after patients have been rested in bed, the condition usually proves to be one of exophthalmic goiter. Colloid goiter develops through the deposit of colloid material in the acini of the thyroid gland. Sections of such glands show when examined under the microscope acini filled with colloid material. The epithelial lining of the acini is low and flattened in type and distinctly different from that seen in exophthalmic goiter.

Colloid goiter is the one type of goiter which may be cured through the administration of medicine and in young patients the goiter, in many instances, may be made to disappear through the proper administration of thyroxin or desiccated thyroid and, in young individuals with colloid goiter, such treatment is preferable to operation. Treatment of this sort should be used only in young individuals and they should be carefully watched during the course of the treatment in order to see that hyperthyroidism does not develop. In older patients with colloid goiter it probably is best to either leave the goiter alone or to remove it surgically and then to administer small doses of iodine, as experience has shown that older patients with goiters which are not producing hyperthyroidism are likely to develop hyperthyroidism when treated with iodine.

ADENOMATOUS GOITER

Adenomatous goiter is probably more often seen than any other. It, too, usually begins in young individuals and produces a nodular, irregularly shaped enlargement of the thyroid gland. It develops through the growth of small encapsulated adenomata which are usually scattered throughout the thyroid gland and which compress the thyroid tissue as they enlarge. When palpated, adenomatous goiter can usually be recognized by the rounded or irregularly shaped nodules which are felt in one or both of the lobes of the thyroid. In younger individuals it is not associated with hyperthyroidism. After the age of 30 adenomata frequently undergo degenerative changes and hemorrhages occur within their capsule; then various degenerative changes follow which produce the goiters which have been referred to as cystic goiters, calcareous goiters, hemorrhagic goiters, etc. All of these types, however, should be looked upon as degenerating adenomata and not as definite clinical entities. The largest goiters seen belong to the adenomatous group and nearly all cancers of the thyroid develop on adenomas in patients who have reached the cancer age.

Our statistics show that over 20 per cent of the patients who consult us with adenomatous goiter have hyperthyroidism but hyperthyroidism is seldom seen in patents under 30 years of age.

*Read before the annual meeting of the Northern Minnesota Medical Association, Crookston, August 9 and 10, 1926.

The type of hyperthyroidism seen in adenomatous goiter differs from that seen in exophthalmic goiter and, in order to differentiate it from the hyperthyroidism seen with exophthalmic goiter, is usually referred to as "hyperthyroidism associated with adenomatous goiter" or "adenomatous goiter with hyperthyroidism." The hyperthyroidism which occurs in adematous goiter is similar to that seen in patients to whom thyroid extract has been given over a sufficiently long period to produce hyperthyroidism. Such patients show nervousness, tremor, increased pulse rate, weight and strength loss, flushed skin, increased sweating, increased metabolic rate, etc., as is seen in all patients with hyperthyroidism, but do not develop, as we see in exophthalmic goiter, exophthalmos, nor are they subject to the crises which occur in exophthalmic goiter. The hyperthyroidism seen in adenomatous goiter develops very insidiously and, no doubt, often exists for a long period before patients are aware of its presence. Many patients with hyperthyroidism from adenomatous goiter consult us for heart trouble without associating the heart symptoms with the goiter. The hyperthyroidism seen in adenomatous goiter does not produce the high metabolic rates seen in exophthalmic goiter and it is not often that we see metabolic rates above 60 or 75 per cent in this type of goiter.

Medical management of adenomatous goiter is, as a rule, unsuccessful and we know of no medicines which will cause such goiters to disappear. In some young individuals a considerable amount of colloid material is present in the thyroid tissue surrounding the adenomata and by administering thyroxin or thyroid extract this colloid material may be made to disappear. The goiter may be somewhat diminished in size by such treatment but the adenomata remain about the same in size and oftentimes are made more prominent through the disappearance of the colloid material from the gland.

When consulted by young individuals with adenomatous goiter we usually advise that the goiter be left alone until the age of 25 or 30 years is reached, when we advise a partial thyroidectomy. Operation is delayed until that time for several reasons: first, because experience has shown that hyperthyroidism is not likely to develop in such patients, left untreated, before the age of 30; second, because the thyroid, no doubt, has considerable influence on the physical and mental development of younger individuals and for this reason it seems best not to disturb the gland until full development has been attained; and third, because the growths are usually multiple and in many early cases so small that some may easily be overlooked at operation. Adenomata left undisturbed at operation usually continue to grow and in this way produce a recurrence of the goiter. The risk of an operation for the removal of adenomatous goiter in patients in good health between the ages of 25 and 30 is so small that it seems better to have patients accept this small risk than to allow the goiter to remain and thus subject them to a risk which runs higher than 20 per cent of later developing hyperthyroidism. The size of the adenomata apparently has little to do with the possible later development of hyperthyroidism and we have seen active hyperthyroidism produced by single adenoma which measured not more than ¾ or 1 inch in diameter. When consulted by patients who already have developed hyperthyroidism from adenomatous goiter we advise an operation provided the physical condition of the patient will permit this being done. Unless an operation is advised in such cases the degenerative changes in the muscles of the heart and other vital organs will continue and when these changes have become very marked even though a thyroidectomy is performed, it is impossible to restore patients to normal health.

Patients with adenomatous goiter not associated with hyperthyroidism and those with mild hyperthyroidism in whom no great cardiac damage has occurred may usually be operated upon without preparation.

Patients with marked degenerative changes in the heart and other organs who show evidences of cardiac decompensation through dilatation of the heart, shortness of breath and auricular fibrillation are usually first placed in bed for a few days. They are then allowed to get up a few hours each day and are operated upon without further preparation or delay. When edema and ascites are present patients are placed in bed for a longer period of time. If the edema and ascites are slow in disappearing, digitalis is often administered until this has disappeared. The digitalis is then discontinued and the patients are allowed to get up for a short period each day. The length of time they are allowed up is gradually increased until they are up most of the time and then the operation is performed. Our operative mortality has been lower after treating pa-

tients in this manner before operation than after preparing them by a prolonged period of rest in bed and digitalis.

EXOPHTHALMIC GOITER

Exophthalmic goiter may develop at any age but is usually seen in patients under forty. The changes which are present in the gland are diffuse in character and usually involve the entire gland. The gland enlarges fairly symmetrically and often produces a "butterfly type of enlargement" similar to that seen in colloid goiter. The gland is much harder than that seen in colloid goiter and, as a rule, is not nodular like the gland seen in adenomatous goiter.

Exophthalmic goiter produces the symptoms usually seen in hyperthyroidism, such as nervousness, tremor, increased pulse rate, weight and strength loss, flushed skin, sweating, increased metabolic rate, etc., and in addition usually produces, if the disease persists sufficiently long, thyroid crises and exophthalmos.

If left untreated the disease in most patients tends to run quite a definite course although we find that the severity differs in different individuals and in different sections of the country. Most patients who develop exophthalmic goiter if left untreated have a gradual increase in the degree of hyperthyroidism for about six months and then have a thyroid crisis. During the crisis they become very sick and often have vomiting and diarrhea with much mental disturbance and a very rapid pulse. The weight and strength loss during such periods is very rapid. These crises last from a few weeks to a month or two and many patients have died during such periods. When the crisis subsides patients begin to improve and although the hyperthyroidism persists usually gain in weight and strength and feel better in every way. After a period of about two years a second crisis often develops and, later, even a third. Eventually the disease tends to wear itself out but most patients by this time have had such great damage to the heart and other vital organs that they are left as physical wrecks.

At the present time operation offers the best chance for relief of the disease. If the operation is done early in the course of the disease it may be done with slight risk, on account of the lack of degenerative changes in the organs, and the results which follow an operation done at this time are very much better than when it is done later. Patients operated upon before marked degenerative changes have occurred and before exophthalmos has developed, in many instances, may be brought back practically to a normal state and are able to resume their normal station in life. The results from operation, however, depend to a great extent upon the duration of the disease and the amount of degeneration which has occurred. The hyperthyroidism may be controlled at any time during the disease by the removal of a sufficient amount of thyroid tissue, but it is impossible to restore the degenerated organs to normal.

At the present time we know of no medical treatment which seems specific in curing exophthalmic goiter. No doubt, certain patients recover spontaneously and from non-operative treatment but the per cent is not large and patients are likely at any time during the course of the treatment to develop a crisis; during a crisis such great damage may come to the vital organs as to leave the patient a permanent invalid in spite of any later treatment used.

Ligations have frequently been performed in exophthalmic goiter because it was found that after ligations, patients gained in weight and were better able to stand the acute hyperthyroidism which often developed after the thyroidectomy. During the past three years Plummer and his associates have shown that dangerous postoperative hyperthyroidism may be practically eliminated by preparing patients with exophthalmic goiter by administering iodine before the operation. Iodine can not be looked upon as a cure for exophthalmic goiter but it seems to possess the power of taking from patients something which produced the postoperative crises. Through such preparation it is now possible to do thyroidectomies upon practically all patients without previous ligations. A primary thyroidectomy saves the patient much time and expense and often several months of active hyperthyroidism. The latter is extremely important because, in many of the patients operated upon previously, the two or three months active hyperthyrodism which persisted between the ligations and the thyroidectomy was just enough, on account of the great damage which occurred to the vital organs during this time, to spell the difference between a good and a poor end-result.

Through the use of iodine the hyperthyroidism seen in exophthalmic goiter tends to change from one which resembles that seen in adenomatous goiter or that produced in patients by giving large

amounts of thyroid extract. It is also possible through the use of iodine to very rapidly cause the thyroid crises seen in exophthalmic goiter to disappear and through such treatment many patients first seen during a crisis may have a primary thyroidectomy from ten days to two weeks later with a high degree of safety.

The metabolic rate gives a very accurate estimate of the degree of hyperthyroidism which exists at the time that it is taken but alone can not be used as a means of determining just when an operation should be performed for exophthalmic goiter. In some patients quite a high metabolic rate may exist without symptoms which would lead one to feel that a crisis was impending. While again we might see another patient in a crisis with a much lower rate.

As a rule, patients with hyperthyroidism from exophthalmic goiter are treated, as soon as the diagnosis has been established, by administering iodine in the form of Lugol's solution (compound solution of iodine) in doses of from 30 to 40 drops a day over a period of from eight or ten days to two or three weeks, when a thyroidectomy is done. After the fifth or sixth day in the majority of patients the metabolic rate drops. There is a corresponding drop in the pulse rate and change in the nervous symptoms and many patients begin to gain weight. Unless patients are very much underweight and have thyroids which appear as though they would be removed with much difficulty, it seems quite safe to perform a primary thyroidectomy with the assurance that there will be little chance of a serious postoperative hyperthyroidism. On the morning of the operation patients are usually given 40 minims of Lugol's solution in divided doses by mouth and after the operation are given 30 minims of this solution in the first 1,000 c.c. of salt solution given by proctoclysis; 30 or 40 minims are then given each day for several days. By this means of preparation the mortality from thyroidectomy for exophthalmic goiter has been definitely reduced and at the present time is less than 1 per cent.

SUMMARY

Clinically we find that practically all goiters may be classified under three types: colloid goiter, adenomatous goiter and exophthalmic goiter. Combinations of these types also occur. Colloid goiter is a goiter of youth, not associated with hyperthyroidism, and often responds to proper treatment by medicine. Adenomatous goiter also usually begins in youth. In younger people it is not found associated with hyperthyroidism. It produces a nodular, irregularly shaped type of goiter and over 20 per cent of the patients later develop a type of hyperthyroidism which differs from that seen in exophthalmic goiter. This type of goiter does not respond to treatment by medicines and should be looked upon as a surgical condition. The most advantageous time for the surgical removal of such goiters is between the ages of 25 and 30. Exophthalmic goiter may occur at any age. It is always associated with hyperthyroidism. It responds best to treatment by operation and the earlier the operation the better the end-result. Iodine used as a means of preparing patients with exophthalmic goiter for operation diminishes very greatly the chances of dangerous postoperative hyperthyroidism.

PHYSICAL THERAPY

The Council on Physical Therapy of the American Medical Association publishes a report on the present status of physical therapy. The Council cautions that while there are certain definite indications for the use of some one or a combination of several physical agencies in the treatment of disease, it is harmful practice to depend on these agencies alone, to use them in place of better proved mthods, or to employ them without having first thoroughly studied the patient from the standpoint of diagnosis. The Council warns against the indiscriminate use of physical measures and the danger that their use may lead into dishonest practice or quackery. The physical measures that have been found to have certain therapeutic value include: 1. Heat, Natural and Artificial. 2. Hydrotherapy. 3. Light. 4. Electricity. 5. Massage. 6. Therapeutic Exercises. The Council feels that the following considerations must receive the most careful attention of the medical profession: 1. Physics, physiology and biochemistry must be called on to dispel the empiricism of the past and to prove the value of various physical agencies. 2. Physical therapy must be recognized as a definite part of medicine, practiced and controlled by graduate physicians. 3. Since physical therapy is a definite part of medicine, every medical school should give thorough training in this subject. 4. Persistent, prolonged effort must be made to eradicate the abuses of physical therapy. The Council proposes to point out to the medical profession the advantages and the disadvantages of physical therapy so that its abuses may be reduced to a minimum, and its scientific possibilities may be appreciated. (Jour. A. M. A., Oct. 16, 1926, p. 1302.)

LOCAL ANESTHESIA IN TOXIC GOITER*

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In a little more than three years, the management and cure of exophthalmic patients have been changed from their former uncertain status, to one of such certainty, security and celerity that no surgeon who has many of these cases to care for, can fail to accord the greatest respect thankfulness and admiration to Dr. H. S. Plummer, whose geninus and capacity for research then introduced the compound tincture of iodine treatment. Every surgeon must now be cognizant of how tremendous a boon this has been. The number of hospital confinement days alone, consequently saved to these patients, constitute an enormous aggregate economic gain. The routine use of multiple operations, single, double or more preliminary ligations, boiling water injections, partial and repeated lobectomies, can now be almost entirely abandoned. The treatment of impending or present crisis in the more toxic of these patients can now be approached with such confidence, that individuals formerly inoperable and uncontrollable may be operated upon, and a safe convalescence predicted with a great degree of certainty. Extremely high basal metabolic rates can be brought back to a point of safety, for surgical attack, in comparatively short periods of time, and the wasting effect of the insidious disease stopped, largely due to proper preliminary treatment by this system.

However, several years before this remarkably successful regimen was introduced, it was noted by all thoughtful surgeons, that the mortality and morbidity rates in operations upon cases of exophthalmic goiter, were greatly influenced by the technical skill of the operator, and his judgment of the amount of trauma and mental perturbation that his patient might safely endure at his hands, in addition to that of the already existing devastating disease. The methods of approach to the ordeal of operation, as employed by G. W. Crile, proved in good hands, to be a very great gain over any less careful technic, and his mortality rates after operation proved the value of his method. The principles of that day can be summarized briefly in these dicta: The stimulation and irritation of the higher centers by fright, grief, or pain must be reduced to the lowest possible minimum; the operation must proceed with the greatest speed, gentleness in handling sensitive tissues, and conservation of blood that is possible to achieve, and there must be removal of sufficient of the offending thyroid gland.

These conditions still constitute the main requisites for safe thyroid surgery. Even with the increased safety that the recent treatment with Lugol's solution has given to surgical craft, it is felt by the author that the treatment of this form of disease must still remain other than a casual and unimportant responsibility. Because this method of preparation by iodine gives a wider margin of safety to the patient than has ever been previously secured, does not mean that, in so severe and debilitating a disease, any factor that leads to still greater well-being, shortened convalescence or freedom from danger from any source, can be abandoned without regret.

It must fairly be conceded that, in some degree, all inhalation and general anesthetics produce some untoward results upon even a normal and vigorous organism. It is granted that in some instances these may be minimal, but it is also known that some may be important, and there are occasional variations of activity with the same drug upon various individuals. The safety of the injection of dilute solutions of procaine is almost absolute, so far as general untoward effects upon the average patient are concerned, and local effects of undesirable character can nearly always be obviated by a careful technic and reasonable understanding of anatomic and physiologic conditions. It is not argued that complications, frequent and severe in general anesthesia, cannot occur with local anesthesia; but it is held that these complications are less frequent, and that they are combated by a patient who has been subjected only to a local anesthesia, with greater competence and success, than by one who has been given a general anesthetic.

Somewhat more than two years ago, and after the value of the compound tincture of iodine had already proved itself in the treatment of exophthalmic goiter preliminary to surgical operation, we were much impressed by hearing a great surgeon declare that now any reduction of morbidity would depend upon the skill of the individual surgeon into whose hands the cases might fall, as the other uncertainties of the disease were under such excellent control. It was assumed

*Read before the annual meeting of the Northern Minnesota Medical Association, Crookston, August 9 and 10, 1926.

then, as now, that by far the most successful and prompt return to health could be secured by surgery. The insistence of Crile that every possible trauma to the patient, either physical or psychic, be avoided or minimized, seemed the best possible solution in the management of these patients, and we began a routine method of operation in which only a local anesthetic was used, except for some degree of morphine and hyoscine narcosis, to control excitation of the higher centers.

At the beginning we were impressed by the writings of several authors upon local anesthesia who insisted that perfect anesthesia could only be secured by a block of the second, third and fourth cervical exits of the nerve supply; but we found this clumsy and awkward, as well as disturbing to the aseptic draping arrangements about the field of operation, and later came to the use of infiltration only, proceeding carefully and quickly through the front planes until the surface of the gland was exposed, then infiltrating the loose connective tissue at the side and behind the lobes, seizing and raising them so that any necessary advancement of the edematized field could be easily made without pain. This can be done with a short needle without the slightest danger of injury to important adjacent structures. In the whole series no such injury has occurred, and anesthesia has been entirely satisfactory. The solution used is one-half of one per cent procaine, in normal salt solution.

In this period of two years, more than three hundred goiters, mostly of the exophthalmic type, have been operated upon by this method, with no reason to feel that it failed in any instance in satisfactory anesthetic effect or in giving the greatest possible lack in undesirable after-effect to the patients. We have seen no healing failure in the wounds attributable to it, the early taking of fluid by mouth is assured, and by-effects of the drug have seemed to be entirely negligible.

With regard to time consumed in getting to the actual removal of the gland at operation, it is quite as rapid as with other methods, and there is the additional advantage that is in some cases important: that the infiltration edema produced makes for easy separation of anatomic planes with the greatest precision and minimum of bleeding.

It is not held that many thyroid situations where surgery is indicated can not be satisfactorily managed with inhalation anesthetics. In the severe and questionable cases, however, it is our opinion that local anesthesia will show frequently so decisive a gain over any other type of anesthesia that a distinct advantage over all other methods may be read in the mortality and morbidity records. Also by this mode of management, some extreme cases can be brought to surgery that may be life saving, that by any other method are impossible and not to be considered. So much then is accorded of advantage to these patients.

On the surgeon's side can be credited these values: The anatomic relationships with local anesthesia are accurate and undisturbed, the edematization of the tissues making their dissection and separation quick and easy; the engorgement of the veins, so notable in nitrous oxide and ethylene anesthesia, is not seen. The control of blood loss is very accurate, and the advantage of a shortened operating time is thus secured. If doubt regarding hemostasis is felt, the patient can be called upon to cough or hold the breath, before closure of the deep operative field, to test the accuracy of the ligations. And again test of phonation can be voluntarily employed by the patient during the operative maneuvers, if it is believed that a recurrent laryngeal nerve may be in danger of injury.

TOXIVI AND TOXOK NOT ACCEPTABLE FOR N.N.R.

The Council on Pharmacy and Chemistry reports that according to the Cutter Laboratory, Berkeley, Cal., Toxivi is stated to be an extract of Rhus toxicodendron for use in the prophylactic and therapeutic treatment of dermatitis caused by poison ivy. Similarly, Toxok is claimed to be an extract of Rhus diversiloba for use in prophylactic and therapeutic treatment of dermatitis caused by poison oak. The Council found Toxivi and Toxok unacceptable for New and Nonofficial Remedies, because the statement of their composition and strength is indefinite; because the claims advanced for them are not warranted, and because they are unoriginal preparations marketed under proprietary nondescriptive names. (Jour. A. M. A., Oct. 16, 1926, p. 1321.)

THE NEUROLOGICAL ASPECTS OF CHOREA GRAVIDARUM*

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Chorea gravidarum may be considered as either a counterpart or a recurrence of chorea minor. The purpose of this paper is to call attention to the inadequacy of the so called rheumatic or toxic theory in explaining the production of all cases of chorea gravidarum and to emphasize certain aspects of the disease which stamp some cases as functional in character.

It should be understood that there is wide variation in the severity of choreiform movements. In general the milder choreas occurring in the course of pregnancy have little significance and are readily amenable to treatment while the more severe movements which rapidly exhaust the vitality of the patient offer a serious menace to the life of the mother and child.

Mild chorea is not infrequently encountered in obstetrical practice, but chorea gravis gravidarum is exceedingly rare. Meulbaum reported sixty-five cases of chorea in persons between sixteen and thirty years of age, and of these 27.7 per cent suffered from the chorea of pregnancy. Kleist from the neurologic clinic at Halle reported 155 cases of chorea in both men and women, and of the 155, thirty-nine or 25 per cent had chorea gravidarum. French and Hicks collected 29 cases from the records of Guy's Hospital in the thirty years preceding their report. Whitridge Williams encountered only one case of the grave type in his obstetrical experience.

Young women in their first pregnancy seem to be predisposed. The usual age of onset is about twenty years and it is very unusual for it to appear after thirty years. Shiell reports 60 per cent of his cases in the first pregnancy and of Buist's cases 59 per cent were in primiparæ

In the majority of cases the movements begin in the first months of pregnancy. Compiling forty-nine cases from seven different sources, nineteen or 39 per cent occurred in the first trimester, nineteen or 39 per cent occurred in the second trimester and eleven or 22 per cent in the last three months. Buist, reporting on 203 collected cases, found 108 occurred in the first three months, seventy during the second three months, twenty-five in the third trimester and sixteen after labor. His figures give the further information that in 214 cases reviewed, 273 attacks were observed. In eleven of them insanity was present; in seven of them the chorea became chronic; sixty of them recovered from the disease before the onset of labor; and ninety recovered after labor. French and Hicks report four recurrences in twenty-nine cases.

In many cases the history of a chorea in childhood is obtainable. Pinard states that seven of the eight cases occurring in his practice had had chorea minor. Buist's 226 cases gave a similar history in sixty-six instances. Charpentier records that 20 or 22 per cent of ninety-six cases had it earlier in life. Wall and Andrews report it in sixteen out of thirty-seven cases.

Chorea and rheumatism occurred in nineteen out of twenty-nine cases reported by French and Hicks. Buist reports acute rheumatism in twenty-five cases and twenty more had both chorea and acute rheumatism in a total of 226 cases. Royston[1] reports an acute arthritis occurring in a nervous manifestation which he believed to be a chorea gravidarum. Shiell tells of a case which suffered from an acute arthritis between pregnancies and in the later pregnancy developed chorea. Duckworth stresses the rheumatic tendencies of varying degrees of severity as being the most likely factor in its production, Mallory, Page, Graves and Birnbaum have demonstrated embolic foci in the region of the thalamus and crux cerebri involving the quadrigeminate, anterolateral and thalamo rubro-spinal tracts, which were thought to be indicative of the rheumatic nature of the disease.

The cause of the disease has been ascribed to a toxemia of uterine origin by Sanger and also by Shaw and by Harding, who base this assertion on the fact that eliminative measures or emptying the uterus favorably influence the disease.

The tendency to abortion is no greater when the patient suffers from chorea than it is in ordinary pregnancy. The normal ratio is quoted as about one abortion in five pregnancies. Barnes' thirty-two cases gave a history of six abortions, or about one to five. Buist's average was below normal. Wall and Andrews' ration was one to

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five. Pinard reports eight healthy children in eight pregnancies with chorea.

The prognosis seems to be a matter of the individual case. A chronic chorea or choreic insanity is rarely encountered in chorea gravidarum. The mortality varies widely from Barnes' 43 per cent to French and Hicks' 10 per cent.

This briefly is the literature on the subject. A critical scrutiny of the case reports discloses the fact that many cases obviously not chorea gravidarum have been included by enthuastic reporters, and these would influence all of the ratios and statistics quoted. The occurrence of rheumatism in its production is obviously to be discounted, for in many cases the simple term rheumatism is used without specifying an acute arthritis. The outstanding features of the disease then as gleaned from this review are: (1) The relative frequency of an attack of chorea minor preceding the pregnancy; (2) the tendency to recur in succeeding pregnancies; and (3) its predilection for young primiparæ in the first few months of pregnancy. Newell states that it is a difficult matter to estimate the influence of rheumatic fever on chorea gravidarum, for the majority of patients who develop this disease give no history of a previous acute rheumatism. He quotes Charcot to the effect that in his opinion chorea is not to be considered as the equivalent in the nervous system of the articular or visceral changes of rheumatism. Newell further states that the general opinion in England at the time he was writing (about 1901) was that chorea gravidarum was a neurosis. This opinion was based by some vague inference on the appearance of chorea minor most frequently about the time of puberty, and of chorea gravidarum in young primiparæ during their first pregnancy. However, it is possible to see that with the heightened emotional tone, which occurs in certain individuals at these two periods, nervous shocks or situations to which no individual adjustment can be made might precipitate a neurosis.

CASE REPORT

The patient, thirty years old, pregnant three months in her fourth pregnancy, was admitted to Ancker Hospital January 12, 1925. Two paternal uncles were insane. She gave no history of an acute arthritis or previous chorea. On her last admission to the hospital she was delivered at term of a dead baby. Following the stillbirth, her mother noticed a change in her personality. Also, she seemed a little off mentally, was often preoccupied and forgot things that had happened in her past. At times she would not answer questions and was somewhat irritable, at other times she was too talkative. She expressed to her children the fear that she would go insane.

Shortly after she became pregnant in October she began to be nervous in her actions, tapped her fingers and bit her lips. These mannerisms became increasingly noticeable and finally she became so nervous that she could not do her work. A few days before entering the hospital she had an argument with her husband and following it began to twitch. On entering the hospital her movements were violent. As the house physician, Dr. Davidson, described them, they were those of a "snake dancer" tragically exaggerated. She had difficulty in speaking and swallowing. Neurological examination disclosed a marked loss of muscle tonus, all of the striped muscles being exceedingly flaccid. She assumed the characteristic posture of so many adult chorea patients which put the greatest number of muscles on the stretch; that is, she extended her legs and then bent her body forward so that her head was towards her feet, her trunk and legs, lying almost flat on the bed, forming the two limbs of the letter V. One side of her body did not seem more involved than the other. Her reflexes were all present and she displayed no abnormal ones.

Her emotional state was at times depressed and at other times agitated. On two occasions she voiced ideas of a delusional nature. She said at one time that she thought the redness of her skin from the constant rubbing on the bed clothes was due to syphilis. At another time she refused food because she thought it was poisoned.

Her movements were violent when she entered the hospital and then quieted down somewhat. Two days after entrance, she awakened at 3:30 in the morning and was very noisy and her movements were exceedingly violent. Charcot has called attention to this sudden change in the character of the movements and thought that it was always to be considered of serious prognostic import.

After consultation with Dr. Albert Schulze a therapeutic abortion was decided upon and suggested to the family. They refused it on religious grounds. One week after entrance she aborted spontaneously a three months old macerated fetus but no placenta was found. Two days later she was curetted for placental retention. At no time did she have fever and her leucocytes were always under 10,000. Following the abortion she lost weight rapidly because of the violence of her movements and increasing difficulty in eating and sleeping, even with sedatives. She died on the twelfth day of exhaustion, without any discoverable intercurrent infection.

The salient features of the case are the presence of certain neurotic mental symptoms months before the actual occurrence of the disease; the sudden onset of chorea, following an emotional scene; the abrupt change and exaggeration in the character of the movements which mark the

more serious phase of the disease; the failure of medication and abortion to ward off the fatal outcome.

Histories of such shocks occur often enough so that many writers, including French and Hicks, Newell and Jones, comment on them as being instrumental in many instances in beginning the disease. Actually they may be only a minor sort of a fright such as a rat jumping out of a cupboard. Mosler's case developed after a fall into the water. Hand's patient fell from a ladder. Bamberger's patient waked at night to find the house on fire and was next day seized with violent choreic twitchings. Jaccound reports a patient who developed violent choreic movements after a family quarrel. Such instances might be enumerated at length. Herman Oppenheim[2] and also Lewandowsky[3] point out that such shocks may be the starting point of a neurosis, even in apparently healthy persons, but Oppenheim believes that far more often the neurosis thus suddenly begun by the shock is the product of a neurotic predisposition generated by an emotional conflict of long standing combined with extreme fatigue or perhaps an infectious disease. Many writers have mentioned that the neurotic predisposition is present in chorea minor, but the literature of chorea gravidarum makes no mention of its presence. However, my records hold a case history of a girl sixteen years old who had been used to satisfy the passion of an older brother. She was unusually innocent and perhaps simple for she seemed to have little knowledge of the consequences of her act. When her mother without knowing what was going on explained the significance of the sexes, the girl began to worry that she might be pregnant, and developed chorea.

Such emotional conflicts occur with great regularity in chorea minor. In fact they occur so frequently that aside from the cases which follow arthritis it is an unusual case which does not give such a history. These conflicts are not necessarily of a sexual nature in chorea minor and what is true of chorea minor may be said to be true of chorea gravidarum, because so many of the cases seem to be a recurrence of a previous chorea in childhood. Viewed in the light of an emotional situation, pregnancy itself is considered by some women as an extremely uncomfortable condition and is not unattended by fear and apprehension, and as such it is interesting to speculate as to whether or not it might cause a chorea to recur. For even chorea coming on after an acute arthritis may recur without signs of an infection, during an emotional situation. For example a boy fourteen years old had scarlet fever followed by acute arthritis. As he was recovering from the rheumatism he had an attack of chorea which lasted two months. He had his tonsils removed and was free from chorea for four years. He is in the hospital at present with an attack of chorea which he states immediately followed the circumstance that his brother caught him in a shameful act and reprimanded him severely.

In this case as in the others cited it seems obvious that the emotional element looms large in chorea, other than those cases which follow rheumatism. Emotional conflicts are always accompanied by fatigue and muscular tension. These two elements, emotional conflict and fatigue, contribute largely to the tendency or predisposition to develop a neurosis which may be set off by a shock of a minor nature. The symptoms of the neurosis are generally grotesque exaggerations of some habit mannerism which the patient voluntarily resorted to, in the beginning of his conflict, to give expression to the discontent going on within him.

Of the other factors at play in the production of the neurosis, chorea gravidarum, and perhaps contributing to the development of the disease, is the heightened emotionalism at the time of marriage. In this regard it is significant that at least three-fifths of the cases occur in young primiparæ in their first pregnancy. Certainly the element of fatigue is not to be disregarded in pregnancy. And along this line attention may be directed to the fact that many women display choreiform twitchings during the course of pregnancy. These twitchings are very annoying to them when they are tired and when there is a necessity to remain quiet in bed. In other words these twitchings occur oftenest when they are especially tired and purposefully try to relax.

The clinicians of Bern, according to Sahli,[4] view these choreiform twitchings as a preformed physiologic mechanism. Sahli calls attention to the fact that before the infant makes voluntary movements its motions are choreiform in character. Remnants of this mechanism survive and may be brought into play in moments of emotional stress, especially in the young. The un-

spoiled child exhibits them when being joked or when caught in a lie. He says further that enforced prolonged muscular relaxation gives rise to a feeling of discomfort in the muscles which is involuntarily relieved by purposeless movements possessing absolutely the character of choreic movements. He believes that these movements are evidently intended (in a teleologic sense) to protect the muscles from any harm that might come to them through too prolonged relaxation. This protective mechanism has a voluntary component, as may be readily seen by the fact that these choreic twitchings relieve this feeling of discomfort in the muscles. These so called physiologic choreic twitchings, he thinks, are most pronounced among highly nervous and excitable persons. He believes that chorea is produced by an abnormal release of impulses, in reality physiologic, and feels that a point of pathologic irritation may set up the necessary abnormal excitation to release these impulses and so he suggests that the remaining peripheral sensory stimuli, no longer actually painful, yet uncomfortable in polyarthritic chorea, may give rise to the sensation of discomfort and thus be the cause of choreic restlessness.

While the theory offers an explanation of the pathogenesis of chorea rheumatica, which disease probably comprises only a minority of actual chorea (according to Abt and Levinson[5] it was found in only a third of their 135 cases) it offers no explanation for the development of those choreas in which no arthritis preceded the chorea. And yet this theory offers some attractive suggestions if they are taken from a slightly different angle. For example, relaxed flaccid musculature is certainly one of the symptoms of chorea, a fact easily proven at least clinically by lifting the patient by the elbows, in which case his shoulders may rise above his ears. In this regard an observation which may be significant in explaining the mechanism by which the movements are kept up may be found in asking the patient to control the movements. They are able to do this momentarily, but almost immediately they experience an extremely uncomfortable sensation in their muscles which involuntarily calls the chorea into play for relief. It has been my observation that the decreased tonicity of the muscles is most marked in the beginning and during the course of the disease until recovery begins, and that with the return of tonicity to the muscles the movements gradually cease. The relaxation of the musculature would therefore appear to give rise to the uncomfortable muscular sensation which involuntarily calls into play the choreic movements.

While the muscular relaxation and the choreiform twitchings which it calls into play undoubtedly are responsible for the repetition of the movements, we have as yet only touched on the manner in which the mechanism is set off. As has already been said many cases of chorea gravidarum are initiated by shocks, and in the case reported in this paper and in many cases of chorea minor the foundation for the neurosis, chorea, is laid by the presence of an emotional conflict combined with fatigue.

The fatigue syndrome in children has been described by Dr. Lawson Lowry.[6] These children are exceedingly active and alert, nervous in their activity, jumping from one thing to another. They are irritable, fussy, cry without adequate cause, are intolerant of authority and difficult to handle. This syndrome is almost identical in young adults suffering from emotional conflict; in other words the nervous, excitable individual referred to as having a predisposition to a neurosis.

Both children and young adults suffering from fatigue seem to be under great nervous tension. As Sahli pointed out, these people are frequently subject to the physiologic choreic twitchings. The type of child or adult which develops chorea is also important in this conception. They may be described as the nice child or the unspoiled child, which means essentially that they have been disciplined and dominated so that the exuberance natural to childhood and early youth has been toned down and the children have conformed to a certain restrained type of conduct. Such children are never sassy or fresh and never talk back to their elders. When they become fatigued they may be as difficult to handle as any other child, but they never openly rebel and express their resentment in talking back or open refusal to do as they are told. They may feel the hand of authority just as greatly as does any other child but through fear they repress the words and express their distaste in wriggling, squirming motions, when doing what they have been ordered to do.

Two cases illustrative of this are briefly reported.

T. T., aged 15, states that since she was very young she has been in the habit of expressing her feeling of rebellion by writhing movements, not when she was told to do anything, but when she was actually performing the task. The father had dominated the entire family and had been very severe. She developed the chorea following financial losses on the part of her father, which in turn meant a more difficult life for her. That is, she had to work every afternoon and evening in the store and by doing so had increasing difficulty in doing her school work. Her father had moved the family five times during the preceding year because it was cheaper to move than to pay rent. By moving so often she lost her friends and was allowed no time or freedom to make new ones. She was the type of child referred to as nice, and had the peculiar faculty of calling forth your sympathy.

The second case is that of A. N., aged 12, who formed the habit of writhing when ordered to perform a disagreeable task. Her mental age was about eight years and she had not passed the fourth grade in school in two successive years. Her father had been increasingly severe in his criticism and management of her and made her work every night at school work. Often he would stand over her with a stick, using it to urge her to further effort. In the course of this type of treatment she began to twitch, and developed chorea. She gave no history of tonsillitis or rheumatism and had had no infectious diseases in the previous seven years.

The history of expressing a rebellious tendency by writhing, squirming movements is elicited very frequently in those children who develop chorea without a preceding arthritis. It is such habits formed under the influence of emotion, to give expression to emotional conflict to elicit sympathy or perhaps exaggerate certain oddities in the mental make up of the individual, which Freud believes are the elements upon which the symptoms of a neurosis are built. He states that at first the patient resorts to such mannerisms wilfully. The conflicting emotions are usually behind their production but the neurosis is not as yet actually present and such habit mannerisms may be indulged in for years without detriment to the individual. However, under the influence of heightened emotions, fatigue or additional stress or worry, some sudden though slight shock occurs and the neurosis develops. Freud[7] stresses the element of surprise in fright as the important factor, for he believes that the fright alone is capable of breaking down certain defenses and calling into play those modes of expressing emotion to which the individual has habitually resorted. These habits may then become the symptoms of a neurosis.

The production of the neurosis, chorea, takes place in the following manner. An individual who is disciplined too severely may show his resentment of authority by squirming or wiggling movements, when ordered to do an act which is distasteful. This mannerism may be repeated over and over, thus forming the habit of expressing emotional conflict in an unusual way. This does not mean that he must necessarily develop chorea, but if he is subjected to too severe disciplinary measures and in addition has other emotional conflicts combined with fatigue, thus laying the foundation for the so-called neurotic predisposition, a slight shock may break down the defenses of the individual and the neurosis may supervene. The symptoms of the neurosis are always a grotesque exaggeration of certain manner of acting which the person wilfully resorted to in the beginning and which the shock causes to become automatic. In the case of chorea the wigglings become purposeless twitching movements, dependent upon the feeling of discomfort experienced in muscles which are too completely relaxed and which are relieved by the choreic movements.

REFERENCES

A. A complete list of references to the literature is found in the Index Catalogue of the Library of the Surgeon General's Office—U. S. Army.

B. Royston's paper listed as ref. (1) also contains a large bibliography—

1. Royston, G. D.: Am. Jour. Obst. and Gyn., 1920-21, vol. 1, p. 945.
2. Oppenheim, Herman: Der Kriegund die traumatischen Neurosen. Berl. Klin. Wchnschr. Mar. 15, 1917, 52, 257.
3. Lewandowsky, M.: Erfahungen uber Behandlung Nervenverletzter und nervenkranker Soldaten. Deutsch. Med. Wchnschr. Dec. 30, 1915, 41, 565.
4. Sahli, H.: Diagnostic methods. W. B. Saunders Co. Phil. 1916, 959.
5. Abt, I. A., Levinson, A. A.: A study of 226 cases of chorea. Jour. Am. Med. Assn., 1916, 1342.
6. Lowry, Lawson: Medical aspects of behavior problems in children. Minn. Med. 8, 39.
7. Freud, Sigmund: A general introduction to psychoanalysis. Boni. Liveright. New York., 1920. Translation and Preface by A. S. Hall.

WHAT IS CHRONIC CONSTIPATION? SOME COMMON FALLACIES IN ITS DIAGNOSIS AND MANAGEMENT*

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The purpose of this discussion is to define if possible the limitations of the term "constipation" and to discuss some of the more common fallacies in arriving at an accurate diagnosis and treatment.

The word "constipation" is defined as "a state of the bowels in which the evacuations are infrequent and difficult, or the intestines become filled with hardened feces" (Webster). According to this definition many conditions may be included under the term, which are very often due to entirely different anatomical, physiological or pathological states; the word really is not diagnostic of the intestinal condition present any more than "rheumatism" is descriptive of the cause or findings of conditions designated as "rheumatic."

Certain fundamental physiological properties of the gastrointestinal tract must be remembered in order to intelligently recognize and interpret the various symptoms and findings attributed to constipation.

The intestinal tract is a hollow tube made up of non-striated muscle, which has the same fundamental characteristics as all involuntary muscle. These properties may be summarized as follows:[1,2,3]

1. Involuntary or non-striated muscle contracts more sluggishly than striated muscle, the rate of contraction is slower, the refractory period longer, and after excessive stimulation the muscle may pass into long periods of fatigue. After prolonged rest it seems to become hyperirritable and responds to slight stimuli by powerful contraction.

This property is important in explaining the massive peristalsis of the colon which usually occurs three to five times per day—upon arising in the morning and after the taking of food.

2. Transmission of stimuli extends from fibre to fibre in smooth muscle.

This fundamental property makes it unnecessary to assume any elaborate conductive mechanism, other than a regulatory one.

3. Smooth non-striated muscle can maintain a lasting contraction.

This physiological property at least partially explains the tendency to persistent spastic conditions of the colon.

4. Muscle tonicity is a fundamental property of non-striated muscle. It may be influenced by various extrinsic (nervous) factors.

5. Smooth muscle in hollow organs responds to tension by contraction.

The intestine has the power to contract in all states of tonicity, whether the calibre is large or small. In hypertonic conditions contraction may occur upon slight distension, while in atonic states the bowel may have an enormous content before contraction occurs.

6. Smooth muscle becomes shortened upon direct irritation (chemicals, etc.).

7. The tendency to rhythmic contraction is a primary function.

These fundamental physiological properties show some variations in degree because of physiological and anatomical requirements. Alvarez[4] has offered evidence to show that considerable difference exists in the quantitative reactions of



Fig. 1. Constipated stool with normal diet.

the different parts of the intestinal tract, and has advanced his well-known "gradient theory." The rate of rhythmic contraction in the duodenum is 20 per minute, and the lower ileum 10 per minute; but an excised segment from the colon is "slow to start beating, its rate is slow, it tends to contract down into a hard knot and stay that way, and the gradient is poor and often reversed." Besides gradients of rhythm the same author believes there are gradients of tonus, or irritability, and of anatomical structure of the muscular and vascular supply of the gastrointestinal tube. He likens the response of any part of the gastrointestinal tract to stimuli, to ripples from a stone thrown in a flowing stream

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of water. Ripples extend in all directions but reach a much shorter distance up stream because of a downward "gradient," the current.

Although the "gradient theory" is attractive and serves to emphasize the physiological qualities inherent in non-striated muscle, it is difficult to explain all of the properties of intestinal motility without attributing some very important function to the elaborate intestinal nervous system. The older theory of Bayliss and Starling's "Law of the Intestine," or Cannon's "Myenteric Reflex," probably over-stressed the importance of the nervous influences.

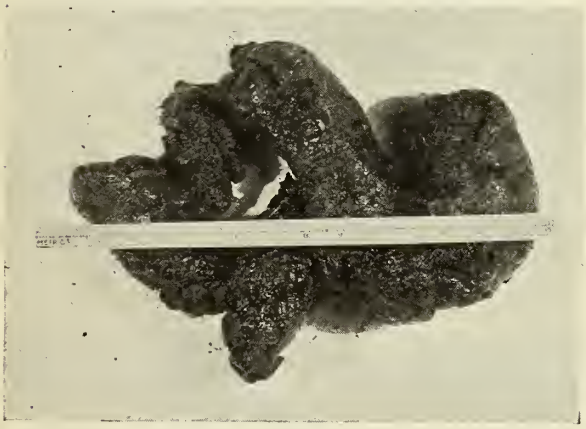


Fig. 2. Normal stool with patient on concentrated diet.



Fig. 3. Normal stool with patient on coarse diet. Notice the food residue.

All of these primary muscular qualities are influenced by many extrinsic factors, of which the nervous are most important. Increased vagus action has a tendency to increase tonicity, peristalsis, and the flow of secretions, while sympathetic stimulation has an opposite effect. Recent physiological investigations,[5] however, would indicate that the vagi and sympathetics are both mixed and therefore the effect of stimulation or inhibition is variable. Division of the extrinsic nerves is followed by recovery of the intestinal function, in much the same way as the heart has been shown to be autonomic.

Keith[9] believes that intestinal muscle has an anatomical resemblance to cardiac muscle, in that there is a gradual structural gradation from muscular tissue on the one hand to the nervous tissue of Auerbach's plexus on the other. At certain areas this myoneural tissue seems to be especially abundant, resembling the regulatory nodes of the heart. No doubt this intrinsic neuromuscular mechanism has a very important *regulatory function,* responding to peripheral and central stimuli, as well as possible excitatory and depressive substances in the blood stream.

The sensations of the patient in abnormal intestinal states are simply the variations of normal physiological reaction. A summary of these sensations is as follows:[7,8]

1. The mucous membrane as far down as the anal canal is insensitive to tactile and thermal sensation, or to irritants.

2. The sensation of fullness is due to a *slow* increase in tension upon the muscular coat.

The volume of intestinal contents necessary to produce this sensation depends upon the tonic state of the muscle fibres. *A sensation of fullness in the rectum causes the call for defecation.*

3. The only immediate cause of true visceral pain is a *sudden* tension exerted upon the muscular coats. Other types of pain may arise from peritoneal irritation, from which it may be referred to the skin, muscles, or connective tissue of the same segmental distribution.

4. Tenderness may be reflex with a segmental distribution, independent of peritoneal irritation or due to tension on the intestinal musculature by external pressure (palpation).

5. Visceral sensibility is increased when there is a hypersensitive central nervous system (neurasthenia).

COLONIC FUNCTION

The colon may be considered anatomically and physiologically as two different organs. The proximal colon is essentially an organ of absorption and the distal colon including the rectum an organ of storage and elimination. A barium meal is normally passed within 48 to 60 hours, but the variation is great in different or even

the same individuals. There is abundant evidence[9] to show that some food residues may remain as long as one week in perfectly normal healthy adults who have apparently normal bowel function.

"After all of the soluble material and most of the water have been absorbed from the intestinal contents, they are carried from the cecum and ascending colon by the mass peristalsis to the pelvic colon, where they remain until the first peristaltic wave of the following morning occurs either as a result of the stimulus of getting up and dressing, or of breakfast. They are then carried into the previously empty rectum, where they give rise to the desire to defecate, which is followed by the normal reflex process of defecation. Consequently during the greater part of the day the cecum, ascending colon and pelvic colon are more or less full, but the rest of the colon is generally empty" (Hurst, 1922).



Fig. 4. Spastic stool. Occurs in cases with spastic descending colon; or the stool may be in the shape of a pencil.



Fig. 5. Baled-hay stool. This stool is formed by a compression in the rectum of spastic balls coming from the distal colon.

The movements of the colon are the resultant of the downward force of perstalsis and the resistance to that force offered by circular muscle tonus. Either or both may be increased or diminished; the symptoms will depend upon the resultant. Reverse peristalsis may occur under certain conditions, due to the peculiar properties of non-striated muscle (possible reversal of the "gradient").

A large percentage of the chronic dyspepsias and of chronic abdominal pain is due to motor difficulties of the bowel, especially the colon. The following is a somewhat unsatisfactory, but a workable, classification of the disturbances of colonic motor function:

A. *Organic Obstruction.* Mechanical interference with peristalsis:
   1. Tumors, adhesions, strangulation, etc.
   2. Developmental membranes and anomalies. (Very rarely obstruction).

B. *"Functional."*
   1. Increased activity:
      a. Diarrhea (muscular balance in favor of peristalsis).
      b. Hypertonic colon ("spastic or hyperkinetic[10] constipation").
         Muscular balance in favor of resistance of circular muscle tonus.
   2. Decreased activity:
      a. Atonic constipation ("hypokinetic[10] constipation").
         1. Congenital. (Hirschsprung's disease).
         2. Acquired.
      b. Rectal constipation, or dyschezia.
   3. Mixed types ("dyskinetic[10] constipation").

(For example, rectal constipation may occur as associated with other colonic dysfunction; or proximal colonic dilation and atony may follow spastic conditions of the lower colon).

Many patients think themselves constipated because they see food remnants in the stools more than twenty-four hours after ingestion, and some seem to believe that any formed stool is "constipated." A cathartic or an excessively coarse diet is taken to "empty the bowel"; subsequently, the patient believes himself constipated because he does not have a bulky stool within the next 48 hours, or the sensation of fullness which follows is interpreted as an overloaded bowel. He therefore does not "allow" himself to go over twenty-four hours without a stool, and in time a vicious cycle is established. His treatment causes an overacting bowel and an insufficient bowel content, resulting usually in a hypermotility of the intestinal tract. The bowel content reaches the empty distal colon, which is now in an almost habitually overcontracted or hypertonic state, according to the physiological properties of non-striated muscle. and due to its daily almost complete evacuation by the treatment. Depending upon the balance between the peristalsis and increased tonicity the patient passes mushy or various types of spastic stools; the latter is nearly always interpreted

as "constipated," and the former as "normal." With both types of stools we have an overactive bowel. (By the term "overactive" is meant that the musculature, either the longitudinal or, more often, the more powerful circular coat, is showing increased tonus or contraction.) This increased irritability is the cause of many of the symptoms, especially the so-called "gas pains" described by the patient. These patients may in an early stage be completely relieved by a little education and the prescription of an average common sense diet without fads, because no abnormality exists except as has been produced by the treatment. Many chronic intestinal invalids are being produced because of an incorrect knowledge of hygiene on the part of the patient, and because he is hoping to prevent disease by taking good care of himself. Such cases are sometimes the victim of the physician's carelessness and poor advice; we should always hesitate before prescribing indiscriminately the use of laxatives, mineral oil, bran or an excessively coarse diet.



Fig. 6. Small, loosely formed stool. Acid in reaction, and containing large quantities of undigested starch.

Briefly the cases of disturbed colonic function included under "constipation" may be divided into those with an atonic bowel or those with a spastic one. Occasionally there is a combination of spasticity and loss of tone—the "mixed" type.

THE ATONIC GROUP

The congenital megalocolon of Hirschsprung is a clinical entity which will not be discussed in this paper. There are acquired *atonic colons,* uniformly dilated throughout, where the patient first consults the physician in adult life and gives no history suggesting the congenital condition. These patients have very few symptoms, except mechanical ones due to the weight of the stool and to mechanical irritation from passing enormously sized hard formed stools. Fecal impaction may occur later with the symptoms of colonic obstruction similar to those found in malignancy or other organic obstruction. These patients usually do not have symptoms of so-called "autointoxication." Some atonic colons possibly are the final dilated stage of the spastic type or are due to the results of taking very large daily enemas.

The atonic colon cases suffer from a true constipation, may go for many days without defecation, and the colon become so dilated and the musculature so thinned out, that probably, in some cases, it can never recover its tonicity. The atonic colon is frequent in senile patients or in cachectic states.

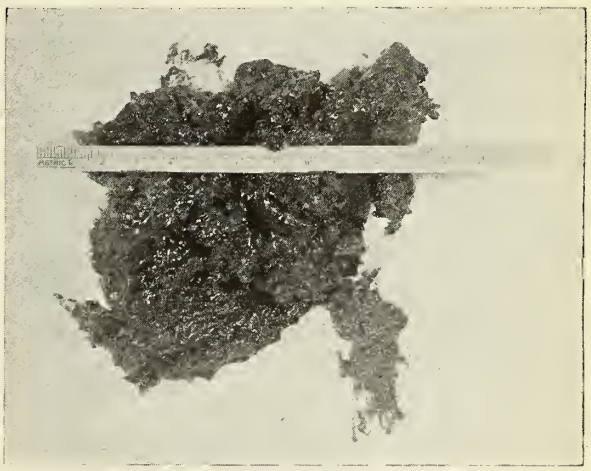


Fig. 7. Mushy stool.

Rectal dilatation may occur with a normal or spastic colon and is usually due to rectal impaction, enema habit or some spinal cord lesion; in each case due to the absence of the normal rectal defecation reflex. In others the normal rectal defecation reflex may be decreased or absent. Rectal dilatation is common in women when the recto-vaginal wall has been weakened by childbirth or it may be secondary to diseases about the anus with sphincter spasm.

THE "SPASTIC" GROUP (OVERACTIVE COLON, IRRITABLE COLON*)

By far the majority of patients whose complaint is "constipation" have a spastic condition of at least a part of the distal or excretory position of the colon (*i.e.*, part distal to the mid-transverse colon). The rest of the intestine, both large and small, attempts to compensate by an increased peristalsis, in much the same way that the stomach attempts to compensate for a pyloric obstruction or the heart for a valvular difficulty. Many of these cases show intestinal hypermotility of a barium meal until the distal colon is reached, where a mechanical functional obstruction is met. The proximal colon first attempts to compensate, but fails because of its poor musculature (in a way analogous to a failing auricle of the heart), and secondarily dilates. This explains probably why the ascending colon is found so frequently dilated in these cases, and as it becomes more and more atonic requires a greater stimulus to obtain contraction. Later in the process of attempted compensation we see the terminal ileum dilated, often resulting in a marked ileac stasis.

The limits of this paper will not permit a discussion of the etiology of the spastic colon except that in general it may be due to:

1. Influences in the bowel itself, as too rough or irritating a diet, or some bowel disease. It may more rarely occur where an insufficient quantity of food and fluids are taken by the patient and the bowel contracts on its content.
2. Secondary to nervous influences, as in neurasthenia.
3. Secondary to general body disease, or
4. Secondary to other intra-abdominal or pelvic disease.

Every case should be exhaustively studied for chronic cholecystitis, recurrent subacute appendicitis, etc., which so frequently cause bowel irritation.

The diagnosis of an "irritable or overactive" colon is made by the history, the physical findings, character of the stools and the roentgen ray; all are characterized by their variability, but may be roughly grouped as follows:

1. Those from the colon.

a. *Pain* is variable, it may be below the navel, or related to fixed parts of the colon such as the flexures, cecum or sigmoid. *No rigidity of the abdominal wall accompanies it.*

b. *Tenderness* upon palpatation over the colon. This sensation is due to an increased tension of the colonic wall which is produced by the palpating hand.

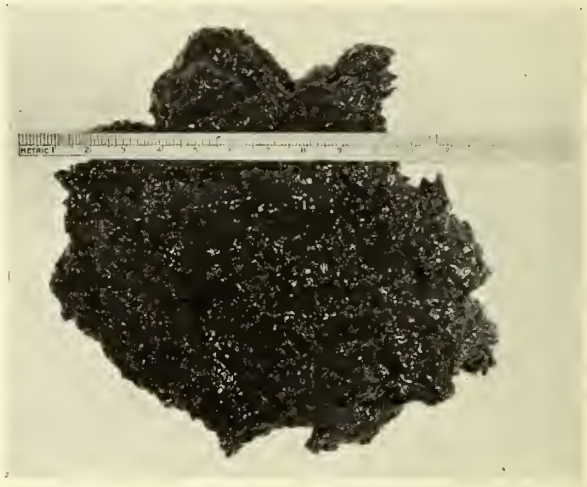


Fig. 8. Mushy, fermentative stool, containing numerous gas bubbles and strongly acid in reaction to litmus.

c. *Gas.* The complaint of "gas" is caused by a sense of pressure experienced by the patient due to irregular peristalsis and intestinal muscle tension. Gas may become trapped between spastic segments, especially near the splenic flexure. The quantity of gas is not increased except when there is fermentation, or when the patients are "air swallowers," conditions which are not so common.

d. *Abnormal defecation sensations.* Very often there is a frequent desire to make stool, or after defecation there is still the sensation of not having emptied the rectum. This sensation is much the same as one would have after a diarrhea, but since the stools are not liquid, but may be spastic balls, is interpreted by the patient as "constipation."

e. *Palpable "ropy" distal colon* and very often a large boggy ascending colon. This sensation of bogginess is sometimes mistaken for abdominal muscle rigidity by the physician.

f. *Abnormalities of motility and secretion, and their effect upon the stools.* An increase of mucus is commonly present in the stools. The stools may be in the form of balls, finger-like, or mushy, depending upon the balance between peristalsis and muscular resistance. It is, at the most, only occasionally that the patient passes

*The term "irritable" was originally used by Dr. B. W. Sippy. See a good review by P. H. Rowe; Journal-Lancet 42: 557-561, Nov. 15, 1925.

cylindrical, well formed, normal stools. Periods of spasticity, diarrhea or alternation of diarrhea and spasticity may occur. On the other hand there may always be diarrhea or spasticity without variation.

2. *Referred pain and tenderness.* This has a segmental distribution similar to any other abdominal lesion.

3. *Reflex symptoms to other parts of the intestinal canal,* causing abnormalities of secretion, motility and tonicity (cardiospasm, pylorospasm, anal spasm, belching, nausea, vomiting, etc.).

4. *Reflex upon the central nervous system* (tachycardia, faintness, etc.).

5. *Symptoms due to toxemia.* The symptoms ascribed to "autointoxication," depending upon absorption of noxious substances from the intestinal tract, have been overstressed, so much so that both laymen and physicians have been led astray. The importance of intestinal poisoning as a cause of ill-health and disease must not be overlooked, but too frequently it has been a blind to cover up medical ignorance.



Fig. 9. Complete drawing of an emulsion of stool, stained with Lugol's solution. Notice starch granules in various stages of digestion, vegetable fibers and numerous clostridia—coccilike organisms.

All of the above symptoms and findings may be related to the taking of food, act of defecation, or nervous state of the patient. Anything which inhibits or excites peristalsis affects the symptoms. Sometimes most of the symptoms appear early in the morning, two to four hours before arising, when the preceding day's food reaches the distal colon.

THE MIXED TYPES

Various combinations of spasm and atonicity may appear. The most common is the association of rectal dilatation with a spastic descending colon and sigmoid. These patients have a difficulty in emptying the rectum or have no stimulus calling for defecation. Very frequently hemorrhoids, anal fissure and anal spasm are present, and the rectal dilation may be secondary to impacted feces or due to habitual use of enemas. The diagnosis is best made by a digital rectal examination to see if the rectum is empty when it should be. Very often we find the "baled hay" stool present, which is due to a spastic stool being compressed into a lobulated mass.

TREATMENT OF CHRONIC CONSTIPATION

1. *Prevention.*—Too much uncertain advice and meddlesome treatment has been given without due consideration of the fundamental physiological properties of gastrointestinal motility.



Fig. 10. Starch granules in stool stained with Lugol's solution.

The following are important hygienic directions which should be emphasized.

a. Drink plenty of water. This should be sufficient, but not necessarily excessive. Water starvation will cause dryness of the stools.

b. Take some daily exercise.

c. Practice nervous relaxation.

d. Go regularly to stool each morning preferably just after breakfast, if the inclination is not present before that time. This is the time when massive colonic peristalsis is naturally most active.

The diet should contain sufficient calcium. The bowel may possibly withdraw lime salts from the body at the expense of the tissues, unless sufficient lime is present in the food. In animals[8] at least it has been shown that probably

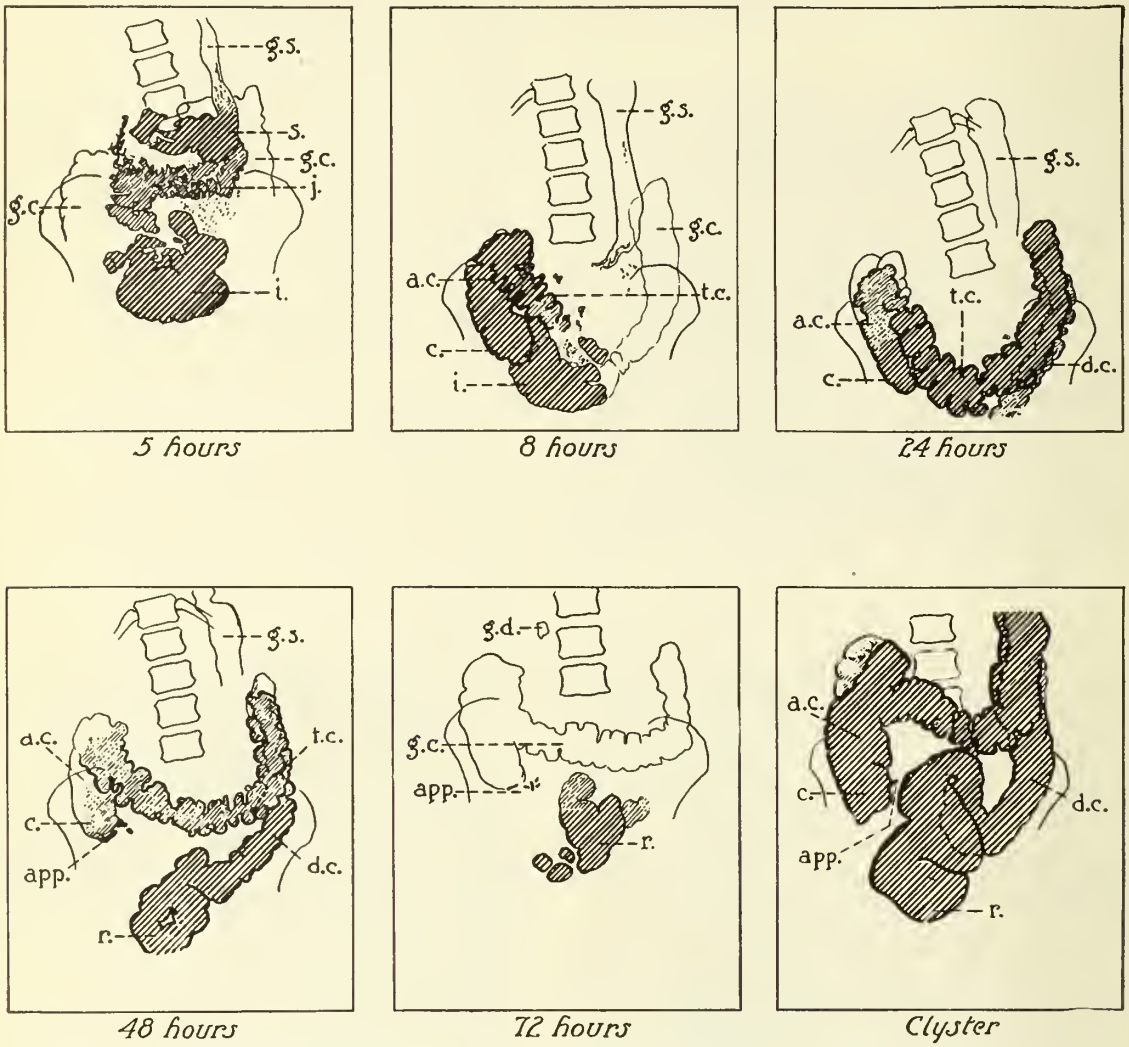


Fig. 11. Case 1. gs- gas in stomach; s- stomach; j- jejunum; i- ileum; c- cecum; ac- ascending colon; tc- transverse colon; dc- descending colon; r- rectum; gs- gas in colon; app- appendix. The findings in this case show only a moderate ptosis and ileac stasis. The semi-invalidism had been initiated and continued by the treatment of mis-interpreted symptoms.

e. Take a plain balanced diet. Foods with bulk should be taken only in an amount which is consistent with having usually a normally formed stool and no bowel distress.

Due consideration must always be taken of the physiological variations of the type of stools, but in the main the normal individual will pass formed stools, cylindrical in shape. Some apparently normal people, who regularly pass mushy or spastic stools, sooner or later are likely to have symptoms of a chronic dyspepsia, especially if proper control is not instituted.

serious lime deficiency may be produced by catharsis or too coarse a diet. Milk is our best lime-containing food.

2. *The Atonic Colon.*—The purpose of treatment in an atonic colon is to stimulate peristalsis and regain tonicity without at the same time overloading the bowel. Cathartics are most frequently of value in these cases, but as a rule a moderately "rough" (but non-irritating) diet is to be preferred, aided by the use of rather large (250 c.c.) warm cottonseed oil retention enemas. The treatment must be adjusted to suit each

case. General treatment of the patient is necessary if any debility exists. Thyroid extract in small doses, but not enough to produce toxic symptoms, will give relief in a few cases, especially in those with subnormal metabolic rates. No routine management can be outlined, because so much depends upon the possibility of the bowel regaining its tonicity and the relation of this tonicity to peristalsis. A regime, frequently changed, must be prescribed in each individual case.

Rectal constipation is more uncommon than has usually been stated. Repeated digital or proctoscopic examinations of cases of "constipation" usually show the rectum to be empty. Less than ten per cent of the cases complaining of "constipation" will show a rectum containing a large cylindrical stool, or a "baled hay" stool made up of small balls compressed into a mass of variable size, depending upon the spasticity of the colon above the rectum, and the size of the rectum itself. The treatment to be instituted is variable, whether it be the retraining of the defecation reflex, relaxation of a spastic colon, treatment of an atonic colon, or stretching of an anal sphincter spasm associated with or without rectal pathology. Women having a poor recto-vaginal wall from childbirth may have serious rectal constipation, and frequently a chronic bowel dyspepsia is superimposed because of the medical management.

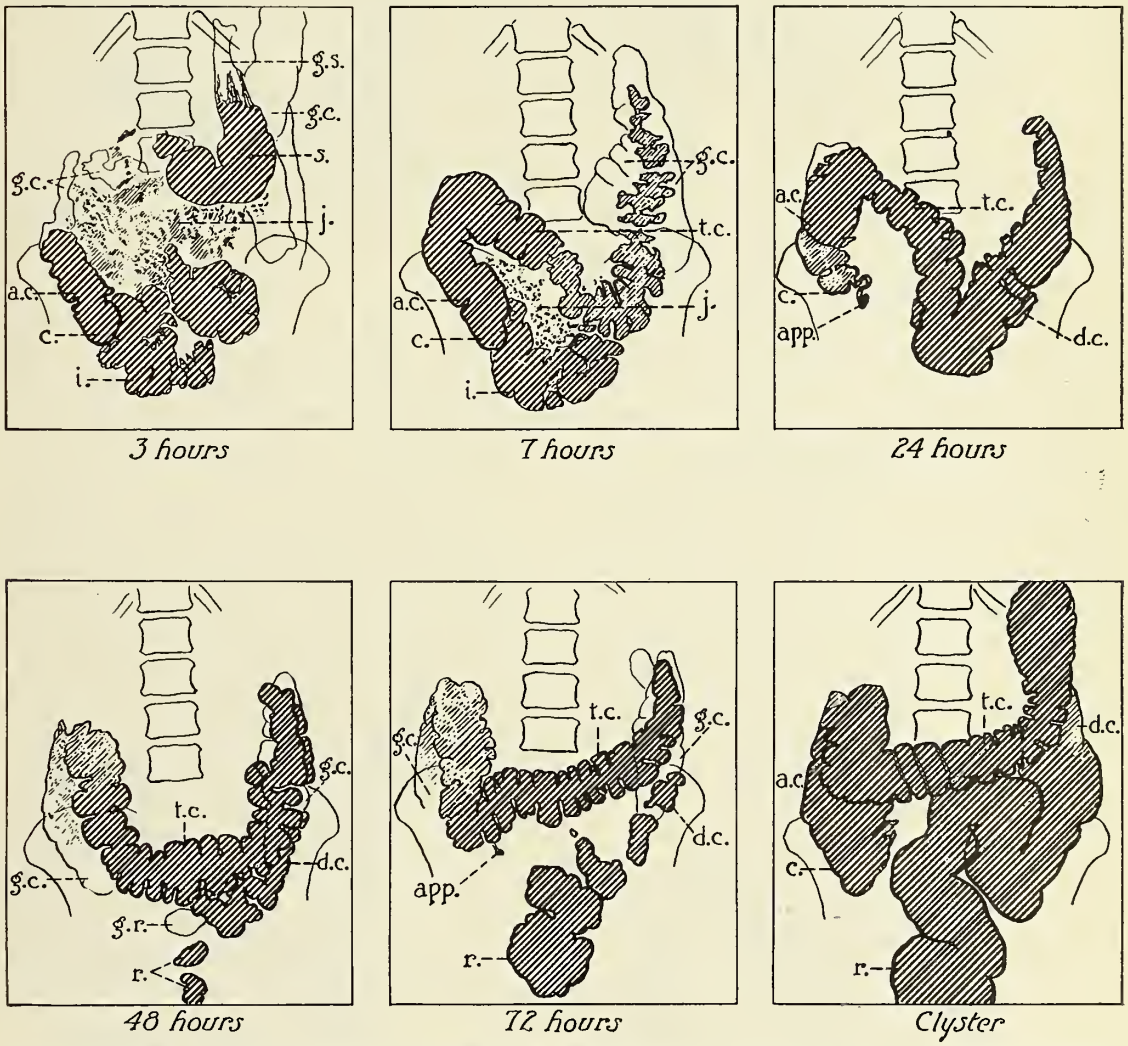


Fig. 12. Case 3. s- stomach; gs- gas in stomach; gc- gas in colon; j- jejunum; i- ileum; c- cecum; ac- ascending colon; tc- transverse colon; app- appendix; dc- descending colon; r- rectum; gr- gas in rectum. This illustrates the findings in a case of true constipation, in which there is slow motility throughout, especially in the colon and rectum. Although the barium has reached the transverse colon in seven hours, it has not reached the rectum in twenty-four hours, and very little in forty-eight hours. No bowel movements had taken place. The clyster showed a very large, poorly haustrated distal colon, which evacuated very poorly.

3. *The Spastic Colon.*—A starvation stool is often spastic, and light feeders may have this tendency normally. We must remember the gut always must contract on something, and, to a certain extent, a balance exists between the size of the stool and this tonicity.

In other than starvation cases we are having an *overactive* or an *irritable* large bowel with the rest of the intestinal tract trying to compensate. These cases should be treated just as if they were cases of chronic diarrhea and not as "constipation."

Increased spasm of the distal colon forms an important part of the picture, but increased tonicity may occur anywhere along the gastrointestinal tract ("vagotonic" states). Although increased tonicity or spasm is primarily present, parts of the proximal colon and ileum may become dilated with or without loss of tonicity and decreased peristalsis.

Many of the patients with spastic stools have been given cathartics and coarse foods, and, although temporarily favorable results may be derived, finally pass into a stage of intestinal invalidism. Concentrated non-irritating foods frequently cause sufficient relaxation so that the patient passes through a period of chronic diarrhea because the intestinal muscle balance becomes in favor of peristalsis. These patients should not be regularly given cathartics, bran, or excessively rough or stimulating foods, for by such a treatment the irritability is increased and a vicious cycle is established.

Temporary stimulation for evacuation of the bowels can be obtained by giving 2 to 4 ounces of warm olive or cottonseed oil in the rectum at bedtime, to be retained over night. (See "Care of Bowels in an Irritable Colon.") Mineral oil and bran may give relief for several months, but do not produce normal stools; both, sooner or later, cause irritation in a majority of cases. Calcium salts with or without belladonna may be used in cases either with mushy or spastic stools. The patient should be given instructions about normal physiology and methods of controlling the diet. The following are directions which are given to the patients, modifying them of course to suit the individual case. The carbohydrates are limited where there is fermentation with flatulence and acid stools. (See "Care of Bowel in Fermentative Dyspepsia.")

Some of the patients, especially those with "spastic constipation," have a psychoneurotic background which contributes an important etiological factor. In such cases, psychanalysis and psychotherapy are most important in the management. Careless dietetic and hygienic treatment of the neurotic patient exaggerates symptoms, but, at the same time, it must be explained to the patient that his symptoms originally were only the expression of a fatigued or unstable nervous system.

By far the most important part in treatment of these colon cases is attention to detail, especially the diet, as indicated by observation of the stools, either by the patient or physician. These cases tax your patience and resourcefulness, but the results of accurate treatment are gratifyingly good.

SUMMARY

1. The term "constipation" is a symptom complex comprising several entirely different disturbances of colonic function.

2. Many patients believe themselves constipated because of their ignorance of normal colonic function.

3. Cases of disturbed colonic function usually called constipation should be treated according to abnormal physiology, determined by a careful history, physical examination, roentgen ray and repeated examination of the stools.

4. The indiscriminate use of cathartics, mineral oil, coarse and irritating foods is producing a large number of patients who are semi-invalids.

5. The cases of bowel disturbances associated with spastic or mushy stools, when recurring in the overactive or spastic colon, should be treated dietetically in the same manner as a chronic diarrhea.

6. The results of treatment based upon sound physiological principles are remarkably good if carried out with accurate detail.

INSTRUCTIONS TO PATIENTS

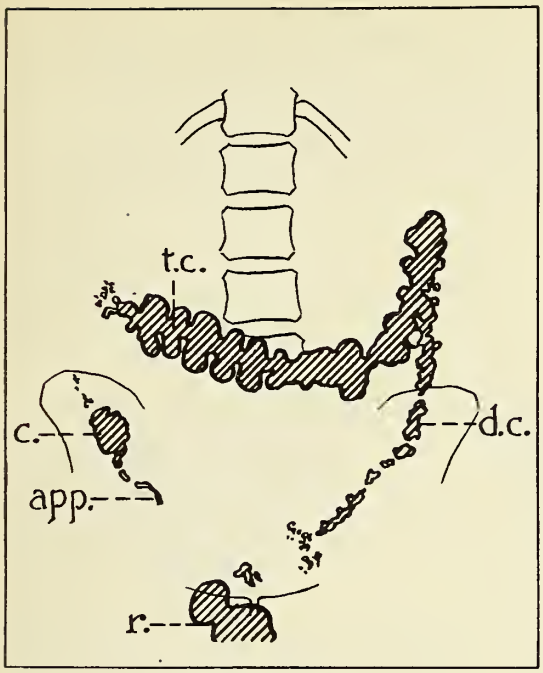
The printed instructions and illustrative diets which are furnished patients suffering from nervous forms of constipation are herewith appended.

Care of the Bowels in an Irritable Colon

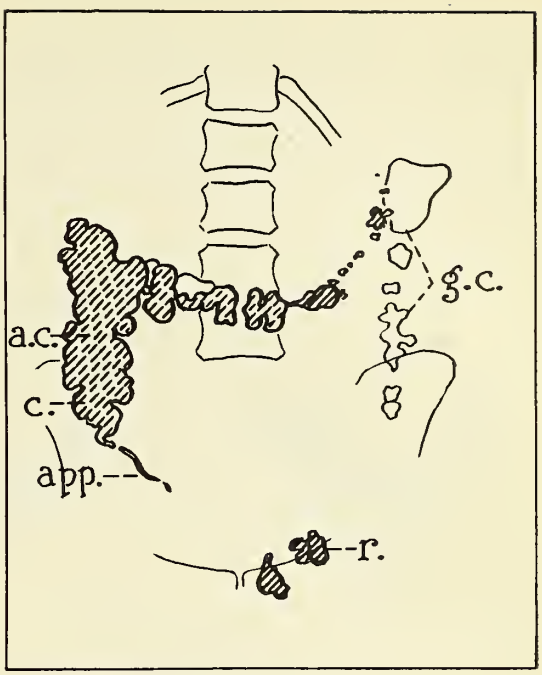
1. A normal stool should be about the size of a twenty-five cent piece, 3 to 5 inches long, and about the consistency of soft putty, or soft moulding clay. There should be one stool per day and never more than two.

2. A constipated stool is one which is a well formed cylinder; as large as, or larger than a normal stool, but has the consistency of dry putty.

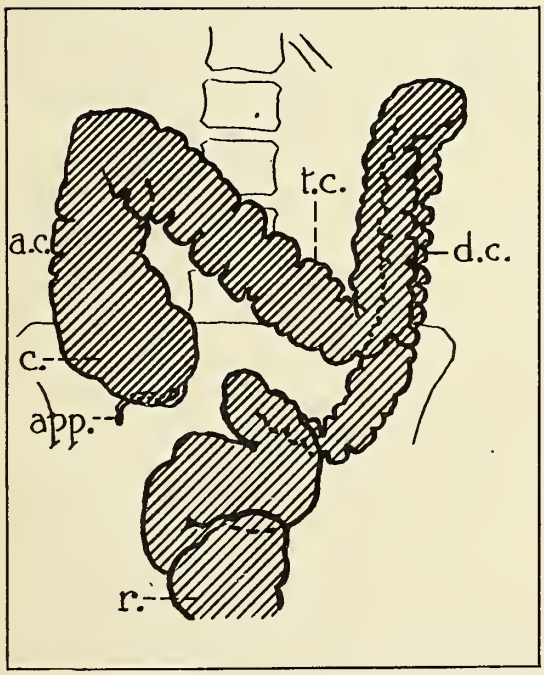
3. A mushy or liquid stool is abnormal.



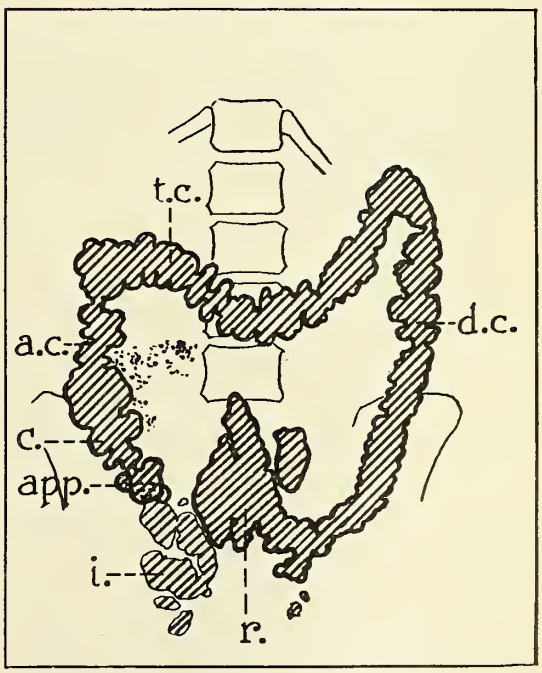
24 hours



48 hours



Clyster



After evacuation

Fig. 13. Case 4. App- appendix; c- cecum; tc- transverse colon; dc- descending colon; r- rectum; gc- gas in colon; i- ileum. This case shows especially the marked spasticity of the descending colon with dilatation of the proximal colon. The haustration has a tendency to be irregular in type.

A spastic stool is also an abnormal stool. It may be like small marbles or flat like a ribbon, or small like a pencil. It may be either hard or soft. This indicates that there is a great deal of spasm in the large bowel (the colon). Sometimes these balls may be compressed into a mass like a bale of hay. This means spasm of colon, but, with a large rectum, a condition which commonly follows the enema habit.

A liquid, mushy or spastic stool may be accompanied by a sensation of having not completely emptied the bowel, although nothing is there. This sensation of a "full bowel" however must not be misinterpreted. "Gas pains" may appear with either unformed or spastic stools, which means that the bowel is being irritated and is "working too fast and too hard."

In examining under the *x*-ray we find in this condition that the food travels too fast. Normally it takes two days or more after a person takes food before it is passed in the stool. When the bowel works too hard nausea is likely to appear.

These abnormal stools may be produced by one of the following conditions:

A. Extreme nervousness and lack of exercise.

B. Over-use of coarse foods and cathartics.

C. Chronic infections; especially from bad teeth, tonsils and sinuses.

D. Occasionally from some other conditions, as gall-bladder disease, appendicitis, pelvic disease, etc.

If this condition in the bowel with spastic or unformed stools persists, inflammation of the lining of the bowel may develop with absorption of poisons into the circulation which may cause many symptoms.

Note—Normally the type of stool varies slightly from day to day depending upon diet, exercise, nervous strain, etc., but the person whose stool is usually normal will be free from trouble, while he whose stool is commonly mushy, liquid or spastic is susceptible to many difficulties. (The last one-half of the stool is used as the guide for describing the stool.)

Treatment of Bowels

Large, hard stools (this is the only true constipation) produce no symptoms with the exception of weight and sometimes trouble with the rectum. A person who has such stools may eat almost anything without dyspepsia; he may even take cathartics without harm.

The treatment of bowel trouble with unformed (mushy and liquid) or spastic stools is entirely the opposite to true constipation.

1. Try to obtain nervous relaxation by plenty of rest and recreation. Moderate outdoor exercise is advisable.

2. Do not take cathartics or foods which have an active cathartic action.

3. Diet: When the stools are spastic or unformed, or when you have severe "gas pains," limit your food to the concentrated foods as follows: (The most concentrated foods are named first.)

A. Milk, cream, butter, cheese and eggs.

B. Lean boiled, baked or broiled beef, mutton, lamb, fowl, and fish. Crisp bacon.

C. Moderate amounts of cereals (containing no bran), white potatoes, rice, puree of vegetables and toasted or stale white bread.

D. Whole wheat, rye, or graham breads. Small amount of oatmeal.

E. Spinach, carrots, string beans, green peas, asparagus tips, cauliflower, squash, lettuce and celery.

F. Oranges, grape fruit and sauces (with very little sugar) of peaches, apricots, prunes, pears, strawberrics, blueberries and blackberries.

G. Gelatine, custards and junket, cookies, sponge cake, cup cake, or angel cake without frosting and at least two days old.

The above diet is a strict diet and should be adhered to as long as you have symptoms and should be returned to if symptoms reappear at any time. If you continue to have symptoms upon taking all of the above diet limit your food to A, B, C and G (called "bland" diet); if on this very limited diet you continue to have symptoms you should report for further instructions.

Other foods may cautiously be tried, one at a time, but as a whole you should eat the above foods, taking more of the green vegetables and fruit sauces when you are feeling well and more of the bland concentrated foods of A, B, C and G when the stools are not right and you have pain.

In general the following foods except those listed above should be greatly restricted or eliminated from the diet: Tea, coffee, raw vegetables, raw fruits, preserves, jellies, honey, pickles, spices, bran, cereals containing bran, flour containing bran, fresh pastry, hot breads, fried foods, veal, pork with the exception of ham and bacon, fish and nick-nacks. Sugar and sweets should not be used to excess.

Temporary Relief of Constipation

If the bowels do not move for two whole days you may obtain temporary relief by the injection of two ounces of warmed "olive" oil (any oil is satisfactory) and retain if possible over night. If the bowels do not move on the following morning inject not over a half pint of warm water to start them.

In case of emergency and you cannot inject the olive oil you may, only occasionally, take one or two tablespoonfuls of Squibbs liquid petrolatum, or plain petrolagar by mouth. This may also do harm if taken regularly.

You will find that occasionally, even when the diet has not been varied, you will have trouble because of nervous strain, physical fatigue, chilling of the body, etc.

Go to the stool regularly after breakfast each morning regardless of whether you have the inclination or not.

Drink plenty of water. A good habit is to drink about a pint of hot (or cold, not iced) water upon arising in the morning. A good spring water is better if you are having abdominal distress or nausea.

If milk seems to distress you, it may be heated to a steam (not boiled) before using it, or you may use raw "certified milk."

Vegetables such as spinach and carrots may be finely divided by passing through a sieve. They may be seasoned with meat juice, butter or lemon juice. Oil dressings may be used but substitute lemon juice for vinegar and use no spices. Do not "cream" with flour.

Canned fruits and vegetables may be used when the fresh foods cannot be obtained.

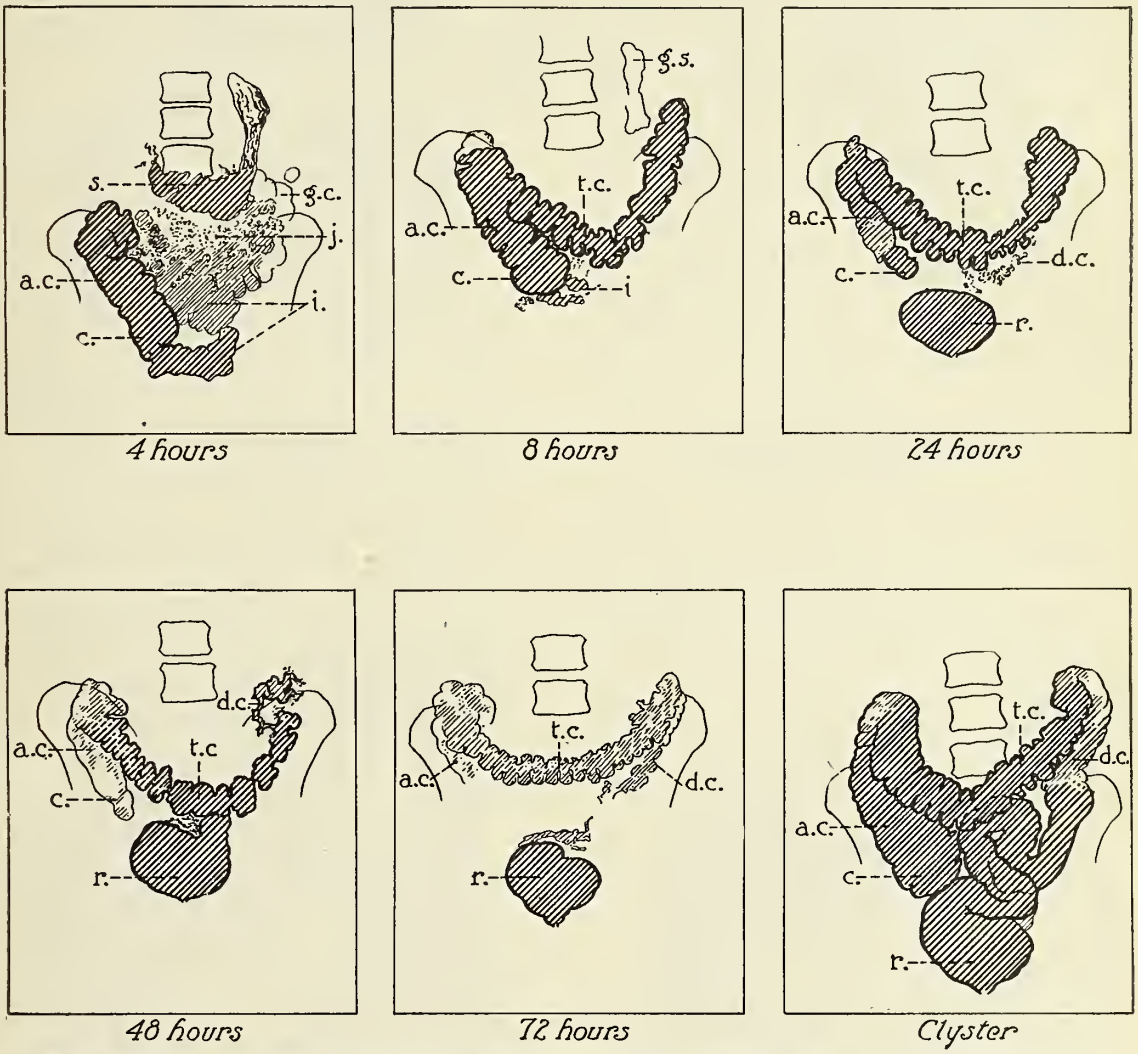


Fig. 14. Case 6. s- stomach; j- jejunum; i- ileum; c- cecum; ac- ascending colon; gc- gas in colon; gs- gas in stomach; tc- transverse colon; dc- descending colon; r- rectum. This illustrates a case of rectal constipation. The barium reached the rectum in normal time, but could not be evacuated.

Be careful about using too much bread, potatoes and cereals unless you are taking plenty of exercise. Maintain your weight (unless it is necessary to reduce) by taking plenty of butter and cream, which can be added to your vegetables.

Very often after having symptoms for months or years the nervous system becomes hypersensitive, so that normal stimulation "electrical currents," which are always running from the body to the brain and of which normally we are not conscious, produce distinct disagreeable sensations, which are interpreted as "gas pains," etc., by the patient. In this condition the nervous control of the digestive tract sometimes has been working abnormally so long, due to causes stated above, that it must be "retrained or readjusted" to normal function. The stool is the best and safest guide.

Very often in your condition the rectum has contracted down, because the stools have not been large enough to keep the rectum normal in size. It takes time for it to "accustom itself" and not uncommonly there is some irritation for a time. If the rectum becomes sore or the passing of stools painful, you should inject 2 to 4 ounces of warmed oil just before going to stool. Following defecation, wash external parts thoroughly with warm water, dry, apply plain talcum powder and press in as far as you can with your fingers. If this does not give relief you should immediately report.

The results of treatment depend almost entirely upon how carefully you follow these directions. Improvement is often slow. Your trouble is the result of months or even years of bad habits and ignorance of

what the normal function of the bowel should be, and "bad habits" may require months to correct. Remember that "gas pains" and spastic stools indicate an irritated bowel just the same as if you had a chronic diarrhea. The diet in each is the same.

The above directions aim to bring about normal bowel habits. Take plenty of the green vegetables and fruits listed as long as you are free from abdominal distress and you are usually having a normally formed stool. Some people have digestive tracts so constructed that they can never take large quantities of irritating foods, while others with continuously large constipated stools do better upon a moderately coarse diet.

If in spite of carefully following these directions you continue to have difficulties, report to us, bringing a list of the foods taken at each meal and a record of the stools, including abnormal sensations. Some more obstinate cases require a short period of "education" in the hospital in order to carry out accurate detailed treatment.

When you do not know what to do, report to the office or by telephone for instructions.

Care of the Bowels in Fermentative Dyspepsia

The cause of fermentation is usually one or more of the following:

A. Extreme nervousness and lack of exercise.
B. Overuse of sweets and starches such as preserved fruits, bread, potatoes, rice, etc. Occasionally an excess of milk.
C. Overuse of coarse foods and cathartics.
D. Chronic infections; especially from bad teeth, tonsils and sinuses.
E. Occasionally from some other more rare conditions which in your case have not been found.
F. Possibly rapid decay of teeth and soreness of gums or lining of the mouth.

The more common symptoms of starch fermentation are as follows:

1. Passage of large quantities of gas by rectum.
2. Belching of gas.
   Often mushy stools containing gas bubbles, so that they may float upon the water. The odor is foul and penetrating. The stools may be loosely formed and contain undigested food. Rarely are they spastic or normally formed.
4. Often headache, muscle soreness, and nausea.
5. Irritation about rectum due to the irritation of the acid stools.

If this condition of fermentation persists the lining of the large bowel may become irritated and mucus is passed in the stools, or there may be so much spasm that the stools become small like marbles or pencil-like. At such times there is likely to be bowel pain and signs of intoxication. A cathartic temporarily relieves the intoxication symptoms, but increases the irritation in the bowel and if persisted in may cause ulcerations.

Sometimes there are periods of diarrhea alternating with spastic stools.

Treatment

1. Try to obtain nervous relaxation by plenty of rest and recreation. Moderate outdoor exercise is advisable and necessary to burn up starches and sweets.
2. Do not take cathartics or foods which have an active cathartic action.
3. Do not take any highly seasoned foods.
4. Diet: When the stools are spastic or unformed, or when you have severe "gas pains," or other fermentative symptoms, limit your food to the foods as follows:

A. Milk, cream, butter, cheese and eggs. Milk should be limited to one pint (2 glasses) per day. This may be whole milk or half and half if you wish to hold your weight. If you wish to reduce, use only the bottom milk, pouring off the top of a one quart bottle. If the milk distresses, you may use raw certified milk and bring the milk to a scald (not boiled).

B. Lean boiled, baked or broiled beef, mutton, lamb, fowl, and fish.
   May take ham or bacon for breakfast only.
   You may use a small serving of meat twice per day. Meat should be tender and thoroughly masticated.

C. Spinach, carrots, string beans, green peas, asparagus tips, cauliflower, squash, lettuce, celery, and ripe tomatoes.
   Vegetables such as spinach and carrots may be finely divided by passing through a sieve. They may be seasoned with meat juice, butter or lemon juice. Oil dressings may be used, but substitute lemon juice for vinegar and use no spices. Do not "cream" with flour.
   Canned fruits and vegetables may be used when the fresh foods cannot be obtained. Use the small young green peas.

D. Fruits: Sauces (very little sugar) of berries, peaches, apricots, pears, prunes (soak over night and throw away the water before cooking), occasionally baked apple, and citrus fruits if they do not distress.

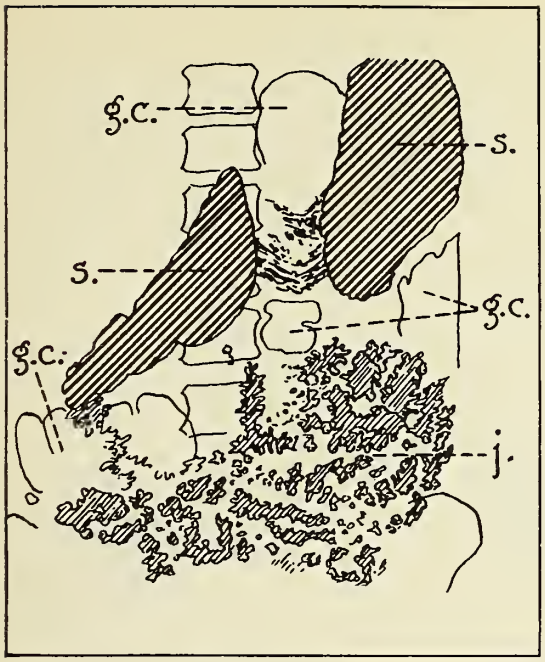
E. Rye bread, well toasted white bread, and occasionally whole wheat or graham bread.
   Do not take more than two slices at a meal. Bread should be at least twenty-four hours old.

F. Gelatine, custards and junket, cookies, sponge cake, cup cakes, or angel cake without frosting and at least two days old.
   A very small amount of nuts except peanuts.

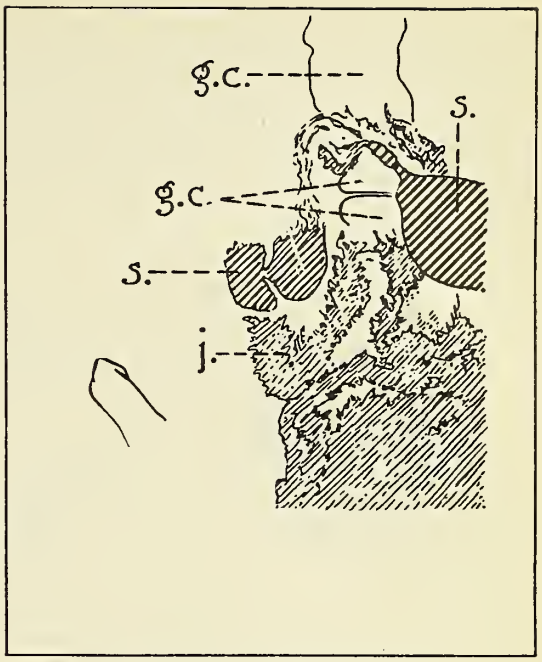
G. Moderate amounts of cereals (containing no bran), white potatoes, rice, puree of vegetables, and toasted or stale white bread.
   Do not take any of these at any meal when bread is taken.

Limit your diet to the above foods, taking relatively more of "A, B, and C" and less of the "D, E, F, and G." If upon this diet your symptoms do not improve eliminate "G" entirely from the diet and use "saccharin" solution (pinch of saccharin to glass of water) in place of all sugar.

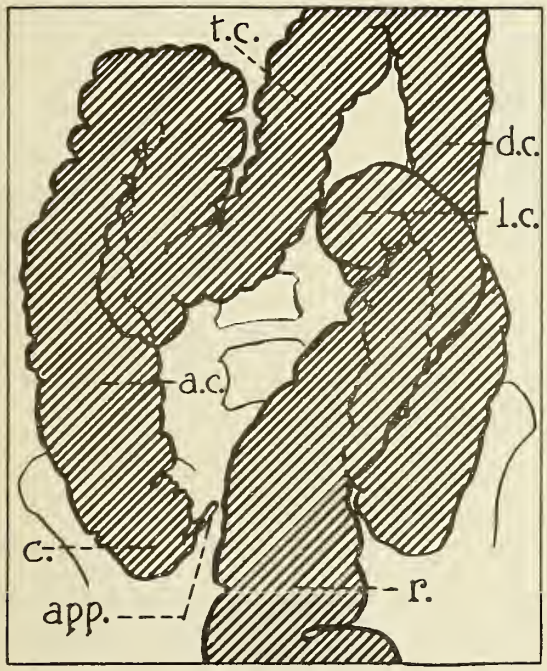
Be sure to report if you continue to have symptoms. It is advisable to bring in a stool occasionally to guide your diet.



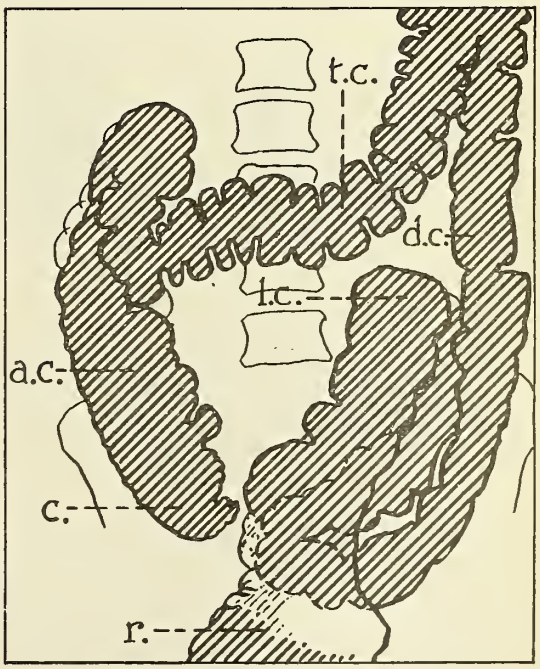
4 hours



4 hours (Oblique)



Clyster



After evacuation

Fig. 15. Case 7. s- stomach; gc- gas in colon; j- jejunum; app- appendix; c- cecum; ac- ascending colon; tc- transverse colon; dc- descending colon; lc- loop of colon; r- rectum. The findings were an apparent hour glass stomach due to pressure from a distended loop of the megalocolon. There was no pathology in the stomach. This patient had no symptoms except pressure in the pelvis, because of the weight from the heavy bowel.

In general the following foods should be greatly restricted or eliminated from the diet: Tea, coffee, raw vegetables, raw fruits, preserves, jellies, honey, pickles, spices, bran, cereals containing bran, flour containing bran, fresh pastry, hot breads, fried foods, veal, pork with the exception of ham and bacon, ices and iced drinks, carbonated water, watermelon, buttermilk, shellfish and nick-nacks. Sugar and sweets should not be used to excess.

LIMITED CARBOHYDRATE DIET

Sample Day

Upon arising drink one pint of hot or cold water.

BREAKFAST—1. Large orange, ½ grapefruit, or berries with cream but little or no sugar.
2. Two eggs.
3. Two thin slices of toast, with butter.
4. One or two glasses milk, or *weak* coffee (very little or no sugar).

LUNCH—1. Soup, if wanted (should not be creamed with flour).
2. Very small amount of lean meat (chicken, fish, mutton, beef).
3. Two green vegetables (spinach, carrots, green peas, string beans, tomatoes, asparagus, lettuce, celery, cauliflower, squash).
4. Two thin slices of bread. Butter.
5. One fruit sauce (very little sugar).
6. Two glasses of milk.
7. Small amount of cheese.

DINNER—1. Soup, if wanted. Meat, if wanted.
2. Two green vegetables.
3. You may substitute a very small quantity of potatoes, rice, or macaroni in place of the bread if wanted.
4. Some simple dessert as gelatine, milk and egg puddings, or fruit sauce.
5. Very weak tea if wanted (very little or no sugar).

Choose your foods from the foods listed in "Care of the Bowels in Fermentative Dyspepsia"; the above gives you an idea of food for the day.

Maintain your weight, or increase it, by taking plenty of butter, cream, oils, and bacon.

LOW CARBOHYDRATE DIET

Sample Day

BREAKFAST—1. Small orange, ½ grapefruit, or berries (without sugar, but may have cream). May sweeten with saccharin if wanted.
2. Two eggs. May have bacon if wanted.
3. One thin slice of toast, with butter.
4. One glass of milk, or one cup of weak coffee without sugar.

LUNCH—1. Soup, if wanted (should be strained and contain no flour).
2. Small amount of lean meat (chicken, fish, mutton, beef).
3. Two green vegetables (should be seasoned with butter, cream or meat juice and no flour).
4. Two thin slices of bread. Butter.
   Preferably use rye bread or crispy toasted white bread.
5. One fruit sauce. (Sweeten with saccharin, no sugar.)
6. One glass of milk. May add cream if you wish to gain weight.
7. Small piece of cheese.

DINNER—Same as at noon. You may substitute a simple dessert, as gelatine or milk and egg puddings without sugar.

Do not take cake very often on this very limited diet.

Very weak tea without sugar if wanted.

Very occasionally you may take a few nuts, except peanuts.

Sweeten with saccharin. Dissolve a pinch of saccharin in a half glass of water and sweeten with a few drops. Any excess tastes bitter.

Choose your foods from the foods listed in "Care of the Bowels in Fermentative Dyspepsia"; the above gives you an idea of the food for the day.

Maintain your weight by using plenty of fats, such as butter, cream, oils, and bacon.

ILLUSTRATIVE CASES

Case 1.—Female. Age 27. Graduate nurse.

The *present complaint* was "constipation" of seven or eight years duration, dull pain under right rib margin for several months, loss of weight from 139 pounds to 86 pounds in two years, vertigo, belching of gas, morning headaches, and mental and physical fatigue.

While taking her nurse's training five years ago, she had some indigestion which was attributed to "constipation." Various cathartics, enemas and coarse diets had been tried without any permanent relief. The patient states that she "never allowed herself" to go more than a day without taking a cathartic or enema, if she did not have a "sufficient" bowel movement. The diet recently had included large quantities of fruits, vegetables and bran. The stools, she states, were "normally" soft or unformed. Gradually she had developed dull headaches, especially in the morning, an indefinite shifting right upper abdominal pain and many other symptoms of a vague nature. These were all temporarily relieved by an active cathartic. Her general health had failed. She had been diagnosed as tuberculous and sent to a sanatorium in Colorado. Here she was studied for a prolonged period and discharged as "not tuberculous," but a laparotomy for possible obstruction was advised. She had become discouraged, mentally depressed, irritable and disgusted with medicine in general.

Her previous health had always been good. During childhood she was subject to "nervousness and headaches."

The *family history* was of no importance, except for a psychoneurotic background.

The *physical findings* were negative except for extreme malnutrition, moderate visceroptosis, secondary anemia, and a low blood pressure. There was no evidence of tuberculosis by physical findings, chest *x*-ray films, or tuberculins.

The *roentgen examination* (Fig. 11) of the stomach showed ptosis, and a slightly delayed emptying time, but nothing else. The terminal ileum was dilated, the proximal colon atonic and the descending colon spastic, after the barium meal. Motility in the terminal colon was delayed. The opaque clyster showed a distensible rapidly filling colon, with poor haustration.

The stools were mushy, or spastic, and contained visible mucus.

The *treatment* was hospitalization and bowel management, consisting of concentrated foods, heat to the abdomen and no cathartics. Ten grains each of Merck's calcium carbonate and calcium phosphate, and, at first, because of hypermotility of the small bowel,

Case 2.—Female. Married. Aged 43.

The *present complaint* was burning sensation in the epigastrium, soreness below left shoulder blade, "gas" with belching and rumbling, "weak spells," constipation and cathartic habit.

She had never been strong but had had no serious illness. Has used cathartics for several years since a

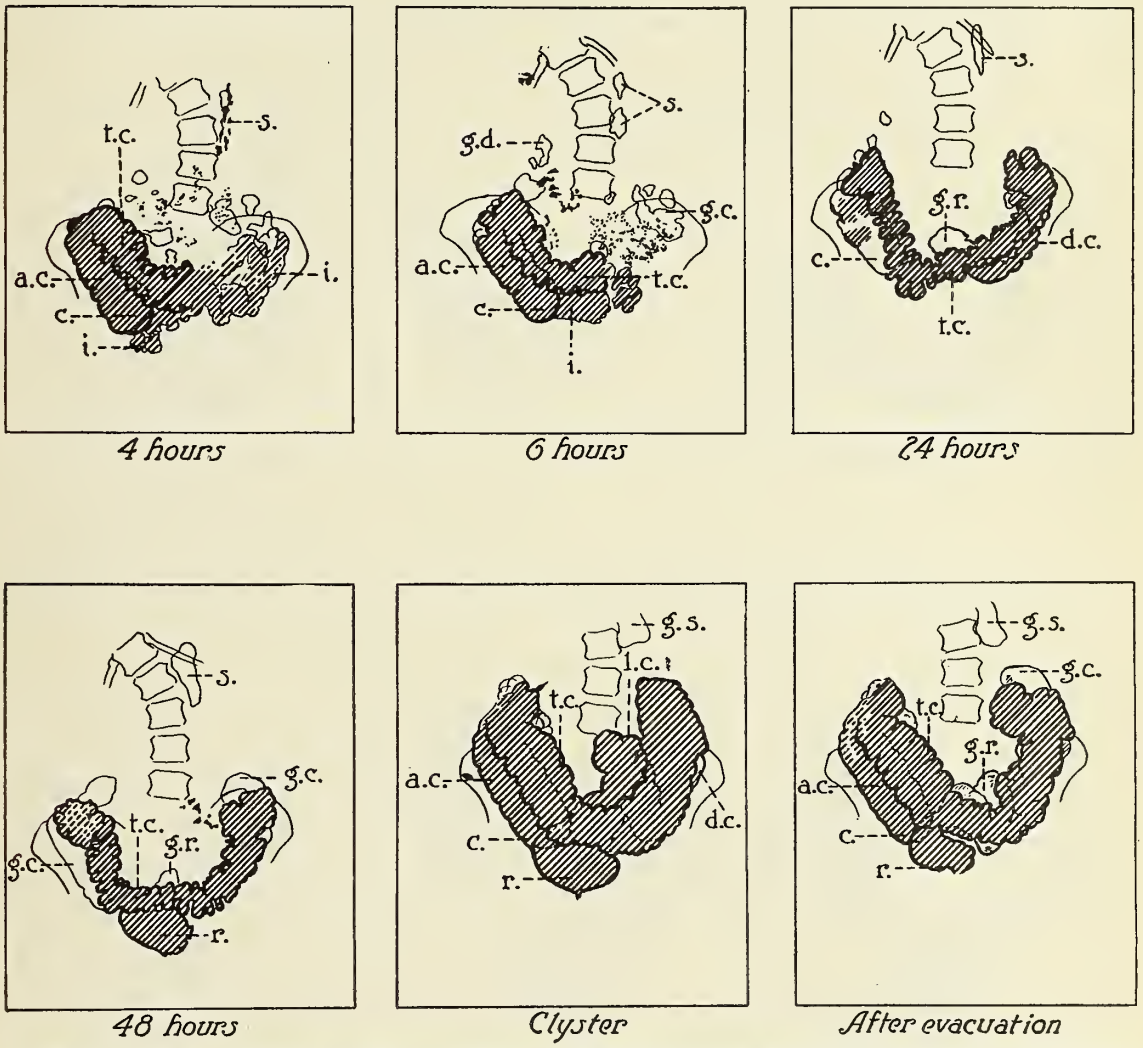


Fig. 16. Case 8. s- stomach; i- ileum; c- cecum; ac- ascending colon; tc- transverse colon; gd- gas in duodenum; gr- gas in rectum; gc- gas in colon; lc- loop of colon; gs- gas in stomach. Note the tendency to spasticity; at twenty-four and forty-eight hours. The rectum was widely distensible, probably due to the habit of taking enemas every day. Clinically, this was a "combined" type.

small doses of bismuth were used. The Alpine lamp was also used daily for its tonic effect.

The *results of treatment* were good. The patient averaged a gain of one-half pound per day. The bowels gradually regained a normal function, although the stools had a tendency to be mushy. The patient was in good condition one year following hospitalization.

Comment: This case illustrates how a vicious cycle in a nearly normal person established a state of chronic invaldism.

"nervous breakdown" just after marriage, fifteen years ago. She has been very nervous for over a year with frequent vague "weak spells," so that part of the time she has been in bed. Palpitation of the heart was very distressing especially at night or after eating. Some slight relief has been obtained by taking quantities of bran and magnesia every other day. Although the stools are soft, there is no satisfaction from defecation. She has lost about twenty pounds in weight.

The *examination* showed a thin, asthenic, neurotic woman in very poor physical condition, but no evi-

dence of organic disease. There was a slightly enlarged "drop heart" and a general visceroptosis.

The *roentgen examination* showed only a spastic distal colon with a large cecum. The colon was tender throughout.

The stools showed mucus and were spastic or mushy.

The patient was taken from cathartics and placed upon the usual bowel management.

She rapidly gained weight and, after several months, began to have normal defecations. She has had no further symptoms. Treatment has been entirely ambulatory (three years).

Comment: This case shows how a neurasthenic patient may have accentuation of a functional intestinal disturbance with reflex epigastric symptoms by a diet and the use of cathartics, as prescribed by former consultants.

No doubt this patient had a "spastic constipation," which should be treated like a chronic diarrhea. In both the intestinal tract is overactive.

Case 3.—Female. Age 25. Single.

The *present complaint* was chronic constipation and cathartic habit.

The patient had been constipated since a child, often going several days without a bowel movement, and then only after a cathartic or enema. She has no sensation of wishing to stool, but never has any other symptoms.

The *past history* was negative—she had never been ill.

The *physical examination* disclosed no abnormalities.

The *roentgen examination* (Fig. 12) showed slight ptosis. A slight delay of the barium meal was present in the ileum and a marked delay throughout colon, including the rectum.

The stools were usually large and formed, and otherwise normal. Rectal examinations repeatedly showed fecal material present.

Comment: This is a typical case of *true constipation.* She was given a modcrately coarse diet, told to take more exercise and was instructed how to retrain the rectal reflex. Olive oil injections were given in place of the cathartics, although this is the type of constipation where cathartics may occasionally be used.

The results of treatment are variable. Thyroid extract occasionally helps.

Case 4.—Female. Age 51. Widow.

The *present complaint* was recurrent pain in lower abdomen, a sensation of a lump under the sternum, constipation, a cathartic habit, palpitation of heart and tachycardia, and nervousness.

About five years ago the patient began to have pains in the arms and legs which were thought to be "rheumatic." She began to use cathartics and at one time took castor oil every other day for two years. She began to have more or less indefinite indigestion with shifting abdominal pain and belching of gas. This was soon followed by epigastric or substernal pressure. For two or three years she has had extreme palpitation of the heart, very frequently during the night or related to bowel function. More recently she has awakened in the night with tremors "like a chill," associated with palpitation of the heart. Following this, the bowels moved two or three times and the symptoms suddenly disappeared. Off and on she has had lower abdominal pain, which comes and goes but is related to bowel function. Cathartics work easily, cause a great deal of distress, but the patient thinks she cannot do without them. The diet has been mostly rough vegetables and coarse breads, which were prescribed by her physician. All sorts of diagnoses have been made and treatment employed, but without relief. She has had prolonged rest in bed for the heart disease with no results. At times she becomes very depressed or has fits of extreme sleepiness.

The *past history* and *family history* have no direct bearing upon the present trouble.

The *physical examination* showed a large, flabby, well nourished woman, and, although somewhat nervous, she gave the impression of having suffered a great deal of pain and distress.

The chest was negative and the heart showed no evidence of disease directly or by functional tests. The abdomen showed tenderness over the course of the colon, and the descending colon rolled under the palpating hand. The pelvic examination showed slight external hemorrhoids, a very tight sphincter, and a very poor anterior rectal wall because of an old rectocele. The nervous examination was negative.

The *roentgen examination* (Fig. 13) showed a normal esophagus and a hypertonic stomach and cap. At the end of five hours the stomach was empty and the head of the meal had reached the descending colon. There was a possible shadow of gallbladder, but no other evidence of gallbladder disease. There was some delay of the barium in lower colon. The clyster showed a small descending colon and a dilated cecum.

The *stools* were spastic or mushy.

Treatment: Perineal repair and bowel management. Calcium salts.

Results: The relief of constipation and other symptoms was complete. For a period of over two years she has had no further attacks of any kind and is free from symptoms as long as she is fairly careful with her diet.

Comment: This case illustrates the results of ignorance and the establishment of a vicious cycle. No doubt the perineal repair aided in following out bowel management, because the old rectal hernia would have made the passage of a stool a little more difficult.

Case 5.—Male. Age 39.

The *present complaint* was constipation, pain in the lower abdomen and back, and pain in groins running down the legs.

The patient had never been robust, but never ill. Had always been "constipated," but usually had a stool daily. Had always thought his elimination was insufficient, for the stools usually were small in calibre.

Several years ago he was advised to use coarse foods, and for the last three years has used a great deal of bran. One year before the present trouble he began to have an occasional lower abdominal pain, not localized but more frequently to the left. It usually came on early in the morning before arising, or was often present before bowel movement. There was rarely satisfaction from defecation. Sometimes he was temporarily relieved by cathartics. At times the bowels

seem "entirely inactive" and "tied up," but at others he has shifting distress and rumbling.

The distress in the lower abdomen has now become a bowel cramp, and usually comes on after the evening dinner or during the night. Rarely has tenderness been more than slight, and there has been no vomiting. The stools contained mucus but no blood has been noticed.

Reagent pure calcium carbonate and calcium phosphate were prescribed between meals. At first, tincture of belladonna was used in small doses.

Results: Relief has been complete for three years. He feels well and has no distress unless he returns to too coarse a diet. He uses no cathartics.

Comment: This case illustrates several points.

1. Spastic constipation should be treated with

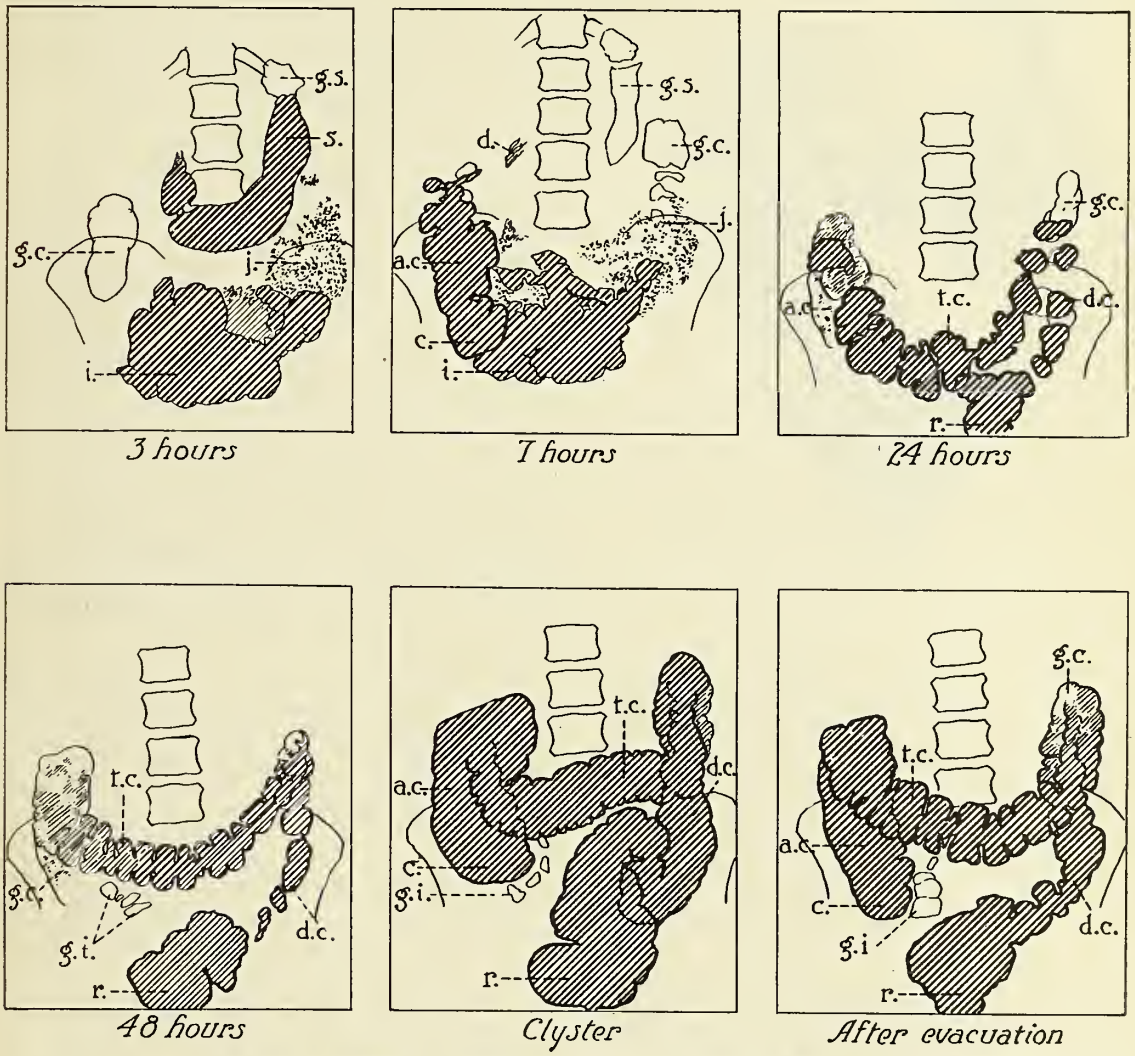


Fig. 17. Case 9. gs- gas in stomach; s- stomach; j- jejunum; i- ileum; gc- gas in colon; c- cecum; ac- ascending colon; d- duodenum; tc- transverse colon; dc- descending colon; r- rectum; gi- gas in ileum. This case was an irritable colon type. Note tendency for barium to form large spastic balls at twenty-four hours. Note the constriction of the lower descending colon, best shown on film after evacuation. The x-ray findings in these moderate cases are frequently slight and dependence must be made on the clinical findings and the examination of stools.

The *examination* was negative except for a tender palpable descending colon. The proctoscopic examination was negative.

There were no signs of urinary calculi. The gastrointestinal tract was normal except for a marked irritablity of the colon. The descending colon was poorly haustrated and the proximal colon dilated. The ileocecal valve was incompetent.

The stools were either mushy or extremely mushy.

The *treatment* was a routine bowel management for the "irritable colon." Ten grains each of Merck's "bland" or non-irritating foods and the patient kept away from all cathartics.

2. Symptoms are brought on by the poor treatment used as a "preventive."

3. A dilated proximal colon often occurs along with a spastic distal colon.

Decreased haustration is common in these cases of long-standing bowed irritability. The "sausage" colon sometimes seen in ulcerative colitis is present in many of the cases, but no true ulceration exists, and pus is never present in the stools.

4. Many "spastic" constipation cases pass through a mushy stool stage when placed upon the "bland" diet, due to relaxation of the colon, before normally formed stools appear.

Case 6.—Male. Age 28. Single.

The *present complaint* was chronic constipation and underweight.

The patient had had an appendectomy and an epigastric hernia repaired five years previously, but otherwise had been well.

He has always had a tendency to constipation, often going several days without an evacuation. For the past two years has been taking a cathartic daily, but has found that an excess of rough diet causes distress. The stools are of large calibre unless he takes a cathartic regularly.

The *examination* was entirely negative except for a palpable cecum which seemed to contract under the hand. The stools at the present time were mushy because of cathartics. A rectal examination showed feces to be present in the rectum.

The *roentgen examination* (Fig. 14) showed a decreased motility of the colon, and the rectum contained barium at 24, 48 and at 72 hours.

The treatment was directed toward retraining the rectal reflex. Muscular exercise, regularity of time for defecation, and a moderately bulky, but non-irritating, diet were prescribed. He was advised to use frequent oil enemas, so as not to overdistend the rectum. Improvement was very satisfactory.

Comment: This case illustrates *true constipation,* the main difficulty being due to the absence of the proper defecation reflex (*dyschezia or rectal constipation*). These cases can be treated by cathartics as long as there is no evidence of irritation. Sometimes, mechanical dilation of the anus, where there is anal spasm, or the repair of a lacerated perineum in a woman will promote a cure.

Rectal constipation occurs in only about 10 per cent of the patients who come to the office with "constipation" as the main complaint.

Case 7.—Female, Age 51. Single.

The *present complaint* was constipation all her life, cathartic habit, and rectal tenoesmus for last two weeks.

The past history was entirely normal except for obstinate constipation since childhood. The present trouble started while upon a long automobile trip, when she began to feel pressure in the pelvis and could not get a good bowel movement. She stated that she had had very little movement for two weeks, even after a large enema. There was now so much pressure and distress that it was almost impossible to sit down. She had had similar trouble before, but never so severe.

The general *examination* was negative. A rectal examination showed a large rectum filled with impacted feces, and there was considerable anal spasm. Following a large enema the patient passed a "bucketful" of fecal matter.

The *roentgen examination* (Fig. 15) showed an enormous and redundant megalocolon. The redundant part of the colon caused a constriction of the barium-filled stomach which at first looked like an hour-glass stomach.

The treatment of these cases is frequently unsatisfactory. Impaction should be prevented by giving a sufficiently bulky diet, but not to the point of irritation. Exercise, hydrotherapy, massage and other methods to increase general muscular tone are helpful. Thyroid extract is frequently indicated.

This patient was treated along this line, and showed definite improvement.

Comment: This case illustrates the few symptoms, other than local, from which atonic constipation cases suffer. General symptoms occur in patients who have an irritable or overactive bowel.

Case 8.—Female. Age 46. Married.

The *present complaint* was chronic constipation, "gas," abdominal pain, general weakness and loss of weight.

The patient had been well in childhood. She had had a pelvic operation of some kind at sixteen years of age; the gallbladder was drained and appendix removed twelve years ago; and the gallbladder removed two years ago. She had had severe scoliosis since childhood.

The digestive disturbances had started in infancy and she has taken cathartics all her life. Following attacks of colic, the gallbladder was removed, but the main dyspepsia and abdominal pain persisted.

She had tried all types of treatment for her trouble, including daily "high colonic douches," duodenal lavage, and a diet consisting of vegetables and large quantities of bran. All treatment had been under the direction of physicians.

The *examination* showed a frail woman weighing only 85 pounds. The abdomen was generally tender. The pelvis was negative, but a rectal examination showed a tight anus and a large rectum containing a large "baled hay" type of stool. The proctoscope showed no ulceration and the stools showed no pus nor blood.

The stools were mushy, in spastic balls, or of the "baled hay" type. Mucus was constantly present.

The *roentgen examination* (Fig. 16) showed visceroptosis, hypermotility of the stomach and no stasis in the ileum. There was some delay in the colon especially marked in the rectum. The patient had great difficulty expelling the barium meal. A clyster showed extreme irritability of the colon with irregular haustration.

The patient was placed upon a strict bowel management including heat to the abdomen. Calcium salts and belladonna were also used. During the next two or three weeks there was considerable trouble with rectal impaction, due to spastic balls of fecal material being compressed into a mass in the rectum. During the times of rectal impaction the patient complained of the symptoms of "autointoxication" including headache, tachycardia, muscle pain, etc., all of which were *immediately relieved* by a small enema. The results of treatment were very good. Her weight increased to 115 pounds, and, at the present time (two years), has to use neither cathartics nor enemas.

Comment: This case illustrates a case of spastic constipation with a secondary rectal dilatation, probably due to the large enemas. This is an example of the "combined type."

Case 9.—Female. Age 45. Widow.

The *present complaint* was nausea and dizziness, chronic constipation, cathartic habit, and malnutrition.

The *family history* showed a tendency to pernicious anemia, two of the family having died of this disease. The father had had sick headaches.

The *previous history* was essentially negative, except that the patient had had *"biliousness"* and vomiting when a child, and supposedly two attacks of appendicitis. She had had sick headaches with vomiting ever since a child.

The *present complaint* started indefinitely. She had had headaches with constipation and vomiting several times each year for many years. About one year ago, she started to have dizziness which had been present off and on ever since. She stated she felt stupid and had soreness down the back of the neck. There were apparently no ear nor eye symptoms to account for her trouble.

She stated that the bowels had always been irregular and the stools were spastic. She had taken a cathartic every day or so for many years. There had been a great deal of rumbling in the bowels, and passing of gas by rectum.

The *physical examination* showed a slender, poorly nourished woman of neurotic temperament. No abnormalties existed in the ears or eyes. The tongue showed slight atrophy of the mucous membrane along the edges. The heart and lungs showed no organic disease.

The abdomen was normal. The spleen was not palpable.

The nervous examination was entirely normal. There was no incoordination nor impairment of vibration sense.

The proctoscopic examination was negative.

The *roentgen examination* (Fig. 17) showed a normal stomach, without retention. The cap was normal. There was a moderate delay in the terminal ileum. The colonic clyster showed a large rectum and a spastic, deeply haustrated, redundant colon. The appendix did not fill.

The *laboratory findings* were essentially negative. The blood, urine and stomach contents were normal. There was no increase of bile pigments in the urine, blood or stools. The stools were mushy, neutral in reaction, and contained considerable starch and numerous clostridia.

Treatment. The patient was given the directions for "Care of the Bowels," with a moderate limitation of bread, potato and sweets. She was also given calcium salts. The patient reported one month later. She had had no headaches nor dizziness, and was having a regular bowel movement each morning without a cathartic. The stools had become mushy, rather than the usual spastic type.

Comment: This case illustrates symptoms of a *spastic* condition of the bowel which has been relieved by the treatment usual for diarrhea. It is very common for spastic cases to go through a period of loose stools, due to relaxation of the bowel by the treatment. Six months later the patient was still in good condition.

Case 10.—Male. Age 39. Married.

The *present complaint* was pain in the lower abdomen and back, extending to the groin and back of legs.

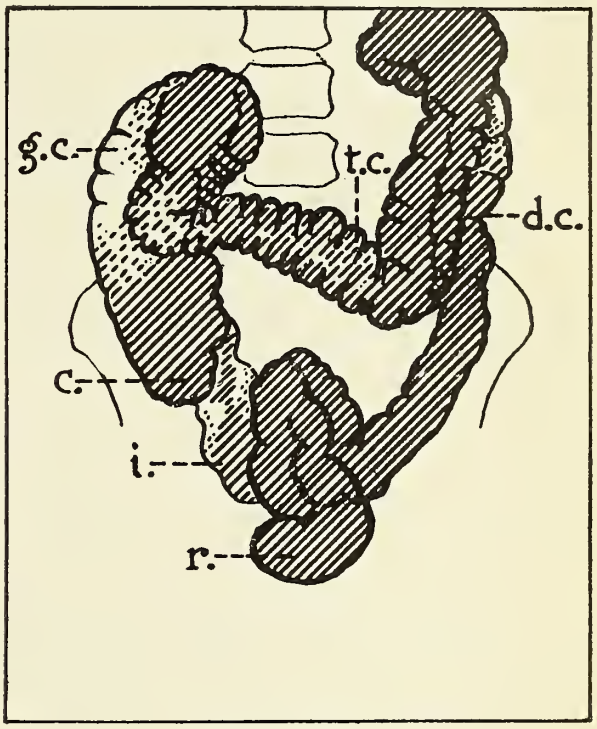


Fig. 18. Case 10. c- cecum; gc- gas in colon; tc- transverse colon; dc spastic, poorly haustrated descending colon; i- ileum; r- rectum. Note spastic distal colon with absence of haustration; the deeply haustrated transverse colon, dilated cecum, and incompetent valve. A "sausage" descending colon is common in these cases, suggesting the possibility of changes in the colonic wall. The stool examinations show no signs of ulcerative colitis, and the proctoscopic examinations are negative. No sharp dividing line exists, in the roentgen findings, between irritable colon on the one hand, and ulcerative colitis on the other.

The *family history* was negative.

The *past history* was non-essential, except that he had suffered from so-called constipation with spastic stools, all his life.

The *present trouble* started about one year before he came to the office. He had had, however, spastic constipation for many years, and had taken large quantities of bran and coarse foods to control it. For the past year, he had had severe pain in the lower abdomen, which usually came on at night, near morning. It was increased temporarily by bowel movement, but a drastic cathartic, after a painful stool, would give relief very often for several days. At the present time, he rarely had satisfaction after a bowel movement. He had passed some mucus. There had been some relief from application of heat.

The *physical examination* showed a somewhat nervously fatigued man, with some tenderness over the left

lower abdomen. Otherwise the examination was perfectly normal.

The *roentgen examination* (Fig. 18) showed no evidence of arthritis nor urinary calculi. The colon was extremely irritable. The ascending colon was large, while the descending colon showed very poor haustration.

The *laboratory findings* were negative, except for spastic or mushy stools. There was no excess of fermentation.

Treatment. The patient was placed upon a "bland" diet and given calcium salts. The stools gradually became normally formed and all pain disappeared. At the present time, three years from the beginning of treatment, the patient is free from constipation and abdominal distress. There is one normal stool a day. He has some tendency to a return of the symptoms, if he returns to too coarse a diet.

Comment: This case illustrates another group of symptoms caused by the irritable colon, and the increase of these symptoms by an excess of coarse foods and the use of cathartics.

REFERENCES

1. Bayless, W. M.: Principles of general physiology 1924.
2. Cannon, W. B.: The mechanical factors of digestion, 1911.
3. Gardner, E. L.: Minnesota Medicine, 8:498, 1925.
4. Alvarez, W. C.: The mechanics of the digestive tract, 1922.
5. Hatcher, Robert A.: Physiol. Reviews, 4:479, 1924.
6. Keith, Arthur: Brit. Jour. Surg., 2:576, 1919.
7. Hurst, Arthur F.: Brit. Med. Jour., 1:941, 1922.
8. Hurst, Arthur F.: Toulstonian lectures on the sensibility of the alimentary canal in health and disease. Lancet, 180:1051 (April 22), 1911; 1119 (April 29), 1911; 1189 (May 6), 1911.
9. Alvarez, W. C., and Freedlander, B. L.: Jour. Am. Med. Assn., 83:576 (August 23), 1924.
10. Schwartz, G.: München. Med. Wchnschr., 59:2153, 1912.

SUPREME COURT UPHOLDS AMERICAN DRUGS

A decision of the highest importance to every physician, pharmacist, drug manufacturer and, in fact, every user of drugs in the United States was rendered by the Supreme Court of the United States on October 11, 1926, when this highest tribunal of the Nation declared that the Chemical Foundation has been acting legally and properly in the purchase of the foreign drug and chemical patents, during the War, and licensing American manufacturers to produce these essential substances in this country.

The sale of the German patents to the Chemical Foundation took place during President Wilson's administration and had, without doubt, a distinct influence upon the outcome of the War, because this transfer permitted American concerns to begin at once the production of various drugs and chemicals which had, theretofore, been made only in Germany, and whose importation ceased with our entry into the war.

President Harding, apparently laboring under some misapprehension as to the purposes and functions of the Chemical Foundation, directed that suit be brought by the Government to set aside the sale of these patents to the Foundation.

The case was first tried in the Federal District Court of Wilmington, Del., and resulted, after weeks of evidence taking, in a finding against the Government on all points.

The case was appealed to the Circuit Court, which upheld the decision of the District Court in every particular.

A final appeal carried the question to the Supreme Court of the United States, where evidence was heard more than a year ago. The long delay in rendering a decision has afforded time for mature consideration. The Court has decided unanimously that the sale to the Chemical Foundation was valid and legal and that the Foundation has made no improper use of the powers which it thus acquired.

This decision is a momentous one for everyone who has anything to do with drugs and chemicals in any way whatever.

To the physician it means that he will have a steady and regular supply of reliable drugs, of American manufacturers, which can never again be upset or cut off by the vicissitudes of war. The same considerations apply to the pharmacists. Among the vitally necessary drugs affected may be mentioned the arsphenamines, cinchophen, barbital, the flavines, procaine and a host of others.

To the drug manufacturer, who has invested thousands of dollars in apparatus for the manufacture of drugs and chemicals under the Foundation's licenses, it means relief from a certain degree of anxiety (though the outcome of the case could scarcely have been in doubt) and a tremendous inspiration to further investigations looking to the production of more and better drugs and chemicals for America.

To the nation at large, it means that reliable medicines will continue to be sold at reasonable prices; and, more or less indirectly, that the dye industry of America which is now in a flourishing condition, thanks to the Chemical Foundation, will be available for government uses should we become involved in another war.

Nor are medicine and pharmacy the only lines of endeavor affected by this momentous decision. The steel and packing industry and many others will be vastly benefited by the freedom of chemical investigation and activity which is now assured them.

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EDITORIAL

Endamebiasis

Reports of the past few years are dispelling the misconception that endamebiasis is a disease of the tropics and subtropics. From various sources throughout the Northwest, these reports indicate that about 10 per cent of the population in the north temperate zone are infected by *Endamœba histolytica*. Nevertheless, the search for the parasite is not infrequently neglected. For this reason the widespread distribution of endameba must be emphasized from time to time.

In this 10 per cent group of the population, only a moderate number suffer with amebic dysentery and the disease is usually not severe. The inactive as well as the active cases of endamebiasis are a constant menace; it is by both that the infection continues to be spread. Many authorities consider that water and uncooked vegetables are the more common channels of infection. Flies are known to carry the endameba. The preparation of food by a person harboring the parasite may be an unsuspected source of infection.

In several diseases of uncertain etiology, the coincident existence of the endameba, or other intestinal parasites, has suggested the question of a direct relationship between the parasite and the disease. Any addition to the etiology of such diseases as iritis, arthritis and certain dermatoses will prove invaluable, but much work remains to be done before the parasites may be considered one of the definite causes of these diseases.

The treatment of endamebiasis continues to be a difficult problem. Since the introduction of ipecac, and more particularly emetin, it has been relatively easy to control the acute symptoms. In spite of the effectiveness of emetin in the acute stages, it often fails to eradicate the parasites, and results are marred by recurrence. Arsphenamin and, more recently, stovarsol and treparsol have been utilized. Preliminary reports indicate that these organic arsenical compounds are much more effective in eradicating the ameba. The saving of time and expense, together with the advantage of oral administration, favors the use of the newer arsenical compounds.

Yatren, an iodide compound, has been used more extensively in the Far East than in this country. Preliminary reports indicate that it will prove of value. As experience with endamebiasis grows, it will become more evident that the possibilities of cure depend more on persisting with varying types of treatment than on the exclusive use of one drug.

PHILIP W. BROWN, M.D.

Medical Relief in Disaster

The recent tornado on the Florida coast has emphasized the need of some organization to furnish prompt medical relief in case of any great disaster. The need has been apparent for some time and a very excellent committee report by Drs. Pusey, Haggard and Phillips, the last three presidents of the American Medical Association, presented the situation in a nutshell at the meeting of the Association in June.

In time of great disaster there is likely to be immediate need for additional medical relief beyond that ordinarily available. Before national, state or Red Cross agencies can assume control there is a need which should be met by some per-

manently established organization that will act instantly but only temporarily. Attention has been called to the need by the medical officers of disaster relief of the American Red Cross.

The A. M. A. committee recommends the use of the already organized profession to handle the need. The president of the county or district society is likely to be a leader among his fellow practitioners and according to their recommendation should logically act as captain of a medical corps. The president of the state association could likewise act as state director of relief in case the disaster assumed large proportions. Thus no new organization need be instituted for a need that admittedly will only rarely arise. Organizations, like organs, have a way of dying when they have no need to function. It was the further recommendation of the committee that the A. M. A. and state associations should emphasize the plan repeatedly so as to build up eventually a tradition, looking to the county president as the natural leader in case of disaster.

The A. M. A. committee plan provides for the captains in case of emergency. It would seem that each county society should make provision for additional members who could be counted upon to respond promptly in case of need.

Steps have already been taken in Minnesota to provide for the organization of several units to render medical aid of this sort. The two largest county medical societies, Hennepin and Ramsey, have approved a plan which in brief provides for the organization of a unit within the county society membership which will render medical aid in disaster when called upon by the Governor of the State, to serve under the command of the senior medical officer of the National Guard on duty in the section concerned. Provision is made for yearly election of officers, surgical and medical sections, each with its quota of nurses.

The Minnesota plan, if we may call it such, is a modification of the A. M. A. recommendation and has been formulated by those interested in the hope of avoiding a repetition of the experience at the time of the Moose Lake fire in obtaining medical volunteers. It should be mentioned, however, that the Moose Lake fire occurred during the war, when many were in the service and those at home were rushed to death.

It is incumbent upon each State Medical Association to decide upon the particular method that seems best and to act accordingly.

Suicides and Newspapers

The unexpected turn yields wit; the unexpected event is news. Newspapers seek (legitimately and properly) to sell themselves through giving their readers an immediate enlightenment on what is going on in the world about them. Life seethes all the time, like the noisy factory. The newspaper, like the skilled machinist, sets its ears to pick out of society the unexpected, unpremeditated tones, rather than the ordinary jumble. It wants priority, and pays dearly to get it; to be in on the first discordant rumble, maintaining that it cannot concern itself with the wreckage that follows its trampling, any more than the fire department can consider ceremony and deference in getting at a fire. All this is accepted, and few there are within the medical profession who do not gladly acclaim the true professionalism of news gatherers and yield to them fully the right to elaborate the principles of their own craft and determine its ethics.

There have been five conspicuous suicides in this vicinity (Duluth) within a fortnight. The means taken by the unfortunates were drowning, shooting and gas inhalation. Many people commented on the striking sequence and the influence each may have had on those that followed. Physicians, as no others, know the turmoil that grinds in the lives of many unstable people.

It is entirely beside the point to discuss whether suiciding is ever a reasoning act. Suffice it to say that mimicry is a childhood trend that many fail to outgrow, and the mechanism of living seems too complicated at times for many whose troubles are as nothing compared with the heroic possibilities so constantly exemplified in many humans about us. Apparently, all many cringing creatures need either to turn them toward life or death is good or bad example. Would we deny the newspapers the obvious right to publish all the details of suicides? No. But, may we not at least ask them why they reiterate the gruesome account three to five times on successive days, each time planting the awful seed in the fallow soil always about us? On the first day, the front page carries the announcement; the next, a statement of the funeral arrangements; later editions discuss the funeral, and usually the death notices finish it up. Each time, however, there is the repetition as to the exact manner of the suicide, and each time this comes out it may be the firebrand that muddles another turbulent mind. E. L. T.

OBITUARY

Dr. Louis B. Baldwin

Louis B. Baldwin was born October 27, 1872, in New York State, the son of T. D. Baldwin, a farmer of that state.

He was a graduate of the College of Medicine and Surgery of the University of Minnesota in 1897, and served his interneship in the City and County Hospital of St. Paul.

He practiced in Cando, North Dakota, for two years. In 1900 he became Assistant Superintendent of the State Hospital for the Insane at Jamestown, North Dakota, and from that time on devoted himself to hospital administration. He later became Superintendent of the North Dakota Institution for the Feeble Minded. In 1910 he was made Superintendent of the University Hospital at Minneapolis, a position which he held for sixteen years, until his death.

He directed the building and equipment of the Miller Hospital in St. Paul and was its Superintendent for the first years of its existence. About the same time he became Director of the newly organized Nicollet Clinic in Minneapolis, and was carrying the responsibilities of these two new organizations, along with that of the University Hospital, which was also gradually undergoing expansion.

During the war Dr. Baldwin held the rank of Captain and later of Lieutenant Colonel in the Medical Corps. He was stationed in the office of the Surgeon-General at Washington, D. C., where his knowledge of hospital administration was of inestimable value.

Dr. Baldwin was a member of the Hennepin County Medical Society, the American Psychiatric Association and the American Hospital Association, serving as president of the last named organization during 1920-1921.

He died October 24, 1926, after an illness of several months. His wife and daughter, two brothers and his aged mother survive him.

Dr. Baldwin was unfailing in his enthusiasm and in the energy which he gave to a task. His absolute honesty and his devoted loyalty to employees and fellow workers endeared him to his friends, whether of high or low degree. There were no evasions nor half-way measures in his strenuous, never-tiring life, which ended at the age of fifty-four with more accomplished than is accomplished in most lives with an added twenty-five years.

It is the opinion of those who knew him best that his unwavering devotion to the work at hand, without recreation or diversion, was in a large measure the cause of his death at an age when his powers of achievement were at their highest.

The following memorial to Doctor Baldwin was drawn up by his fellow associates at the University of Minnesota:

Louis B. Baldwin was built of the sterling stuff that goes into the making of a true man. He was strong, earnest, faithful. He lived according to his light. A staunch friend, a fair fighter who fought for the thing he believed to be right, he was one who could yield, but who could not compromise. Defeated, he could again join hands with those who differed from him and still work on.

He was an able administrator by nature and by training. He rendered good service alike to the States of North Dakota and Minnesota. He was a loving son of his Alma Mater. He was a loyal colleague; capable of personal sacrifice in any cause he espoused; he admired strength and candor; he was intolerant of weakness in any man.

He has done a good work and has done it well. His associates deplore his early death. They realize the emptiness of the place he has so well filled.

They share the grief of his family. They would fain offer them some effective solace. They are glad for the legacy of honor and faithfulness he has left to them—a consoling memory of him whom they have lost.

To their friend his fellows of the Faculty of the Medical School give their last "Hail and Farewell,"—a fitting salute for a soul as strong and brave as his.

Dr. Otto F. Fischer

Dr. Otto F. Fischer died suddenly Monday, October 11, at his home in Houston, Minnesota, at the age of 54 years. Death was due to angina pectoris.

Otto Ferdinand Fischer was born at Le Sueur, Minnesota, August 21, 1872, the son of Rev. and Mrs. Ferdinand Fischer. He received his early education in the schools of Northfield, Minnesota, after which he entered the medical school of the University of Minnesota. His internship was served at Asbury Hospital and St. Mary's Hospital in Minneapolis. Following this he served a term as Assistant Physician in the Quincy Mining Company's medical service at Hancock, Lake Superior, Michigan.

Dr. Fischer began his private practice in Caledonia, Minnesota but soon afterward moved to Houston, where he had maintained a practice for the past twenty-eight years.

Dr. Fischer was a member of the Houston-Fillmore County Medical Society and had acted as secretary of that organization for the past twenty years. He was also a member of the Minnesota State Medical Association and a Fellow in the American Medical Association.

Dr. Fischer was active in civic affairs in his community. He served as a member of the school board in the Houston district for a number of years. He was a director of the Houston State Bank at the time of his death and had long been a leader in church work in the community.

Dr. Fischer is survived by a brother, Dr. Arthur F. Fischer of Hancock, Michigan, and two sisters, Miss Martha A. Fischer of Ladysmith, Wisconsin, and Miss Laura C. Fischer of Sioux City, Iowa.

The following resolutions were passed by members of the Houston-Fillmore Medical Society in remembrance of their secretary:

Resolutions of the Houston-Fillmore County Medical Society.

Whereas, it has pleased Almighty God in his infinite wisdom to take out of this world the soul of our de-

ceased brother, Dr. O. F. Fischer, causing great sorrow and regret to the medical fraternity;

Whereas, Dr. Fischer was a member in good standing of the Houston-Fillmore County Medical Society, having faithfully served as its secretary for many years, was an ardent worker for the society since its incipiency and had thereby won the admiration and high esteem of its members;

Whereas, the doctor had gained the love and affection of the community in which he practiced his chosen profession by ministering to the sick with skillful hands and a kind heart, relieving both physical and mental distress and suffering—

Be it resolved, that we reverently and humbly bow to the will of an all-wise Prividence, believing that He doeth all things well and to the glory of his name.

Resolved, that in the untimely death of Dr. Fischer the Houston-Fillmore County Medical Society has sustained a great loss and that his absence will be keenly felt by its members.

Resolved, that the community has lost an able, efficient and conscientious physician, whose passing will leave many sorrowing hearts and cherished memories of a kind and sympathetic doctor whose ministrations were freely bestowed.

And be it further resolved, that a copy of these resolutions be sent to the members of the bereaved family that they be published in the Houston Signal and that they be spread on the records of the Houston-Fillmore County Medical Society.

H. W. Christianson, M.D.
L. K. Onsgaard, M.D.
R. V. Williams, M.D.

Dr. C. L. Codding

Dr. C. L. Codding, who practiced medicine in Duluth for thirty-four years, died Friday, November 5, at the home of his son, J. Albert Codding, in Virginia at the age of 69.

Dr. Codding came to Duluth in 1888 and served for years in public capacities in addition to his medical work. His public service included twelve years on the board of education and several terms as a member of the library board. As a member of the latter organization he was instrumental in obtaining the erection of the Duluth public library. He was a member of the St. Louis County Historical Society and of other groups.

Dr. Codding was born in Towanda, Pa., May 21, 1857. He was graduated from the medical college of the University of Pennsylvania in 1883, and after practicing medicine in the Pennsylvania coal mine regions for several years, he came to Duluth, where he opened his office in 1888. He retired in 1922 and for the next two years resided at his country home near Deerwood. Since then he made his home with his son in Virginia. The widow and his son survive.

Dr. James Walter Warren

Dr. J. W. Warren of Faribault died suddenly at his home Friday, October 15, at the age of 45 years.

Dr. Warren had been a practicing physician and surgeon here for the past three and one-half years. He was born in St. Paul, Minnesota, where he received his early education. He lived for a number of years at Charlottesville, Va., where he attended the University of Virginia, receiving the degree of doctor of medicine from this school.

Dr. Warren practiced in Blooming Prairie, Minnesota, and four years ago entered into partnership with his brother, Dr. F. S. Warren of Faribault.

In 1912 he was united in marriage to Miss Ellabelle Coe of St. Paul, who survives. Dr. Warren is also survived by three children; a brother, Dr. F. S. Warren of Faribault; and three sisters, Mrs. J. George Smith of St. Paul, Miss Grace E. Warren of St. Paul and Mrs. Archie W. Hawkins of St. Louis, Mo.

Dr. James Edward Merrill

James Edward Merrill, a practising physician of Amboy, Minnesota, for the past twenty-nine years was born in Ontario, Canada, April 19, 1867. He lived in Winnipeg during his boyhood and then moved to Minneapolis. In his early manhood he attended Parker College at Winnebago and later the University of Minnesota, being graduated from the Medical School of the latter institution in 1896. He practised at Winnebago for a short time, where he married Gertrude May Hargreaves. He then established an office in Amboy, where he has resided ever since, and where his four children were born and brought up.

Dr. Merrill was actively interested in all public offices. He was especially prominent in the National Guard and went to the Mexican Border with that organization in 1916, as a Major of the Medical Corps of the Second Minnesota Regiment. He also served as Sanitary Inspector at Deming, New Mexico, in 1917, but was forced to leave the service on account of ill health.

He was known to his friends as a robust, active man, fond of athletics and of all outdoor sports. Only a few weeks before his death he took a trip up into the north woods of St. Louis County, but was taken home from there because of his failing strength. The past winter was spent in California on account of his poor health, but he returned to his practice in the spring for a short time before he was finally overtaken by the fatal malady which brought about his death in Mankato on August 7, 1926, at the age of fifty-nine years.

Dr. Merrill was a highly esteemed member of the Masonic Lodge, the Odd Fellows and the Rebekas, all of which organizations officiated at his funeral, which was held at Amboy. Friends from Amboy and all the neighboring towns filled the church and overflowed onto the lawn to pay their last tribute to their beloved physician and friend.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNEAPOLIS SURGICAL SOCIETY

Dr. John B. Deaver of Philadelphia will address the Minneapolis Surgical Society at its December meeting at 8 P. M., Tuesday, Dec. 2, 1926, in the library of the Hennepin County Medical Society, Donaldson Building, Minneapolis. The subject of Dr. Deaver's address will be "Chronic pancreatitis," illustrated by lantern slides.

All physicians are cordially invited to attend.

INTERSTATE POSTGRADUATE ASSEMBLY

The annual meeting of the Interstate Postgraduate Medical Association of North America at Cleveland in October boasted an enrollment of between five and six thousand. The rather distinguishing features of this year's meeting were the larger number of foreign guests and the frequency on the program of symposii.

Officers for the year are: President, Dr. Carl L. Larsen, Saint Paul; president-elect, Dr. Lewellys F. Barker, Baltimore. The following officers were re-elected: Managing director, Dr. William B. Peck, Freeport, Illinois; associate managing director and treasurer, Dr. J. Sheldon Clark, Freeport, Illinois; executive secretary, Dr. Edwin Henes, Jr., Milwaukee.

Kansas City has been selected for the October, 1927, meeting of the Association.

UPPER MISSISSIPPI MEDICAL SOCIETY

The upper Mississippi Medical Society and the Stearns-Benton County Medical Society held a joint meeting at Little Falls, Minnesota, Wednesday, October 27, 1926.

The following program was given:

1. Fractures—Dr. A. E. Amundson, Little Falls, Minn. Discussion: Dr. T. Davis, Wadena, Minn.; Dr. E. Johnson, Bemidji, Minn.
2. Goiter—Dr. Fred H. Stangl, St. Cloud, Minn. Discussion: Dr. J. A. Thabes, Brainerd, Minn.
3. Observations in Obstetrics—Dr. Fortier, Little Falls, Minn. Discussion: Dr. F. J. Schatz, St. Cloud, Minn.; Dr. B. W. Kelly, Aitkin, Minn.
4. *X*-ray Diagnosis of Gall Bladder Disease—Dr. M. J. Kern, St. Cloud, Minn. Discussion: Dr. R. Gillmore, Bemidji, Minn.; Dr. M. P. Gerber, Brainerd, Minn.
5. Headaches—Dr. H. L. Lamb, Little Falls, Minn. Discussion: Dr. H. E. McKibben, St. Cloud, Minn.

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

At the meeting of the West Central Minnesota Medical Society held at Morris, Minnesota, Oct. 23, 1926, the following program was given:

The Latest Treatment of Burns—Dr. O. V. Opheim, Starbuck.

Medical Legislation—Dr. Chas. Bolsta, Ortonville.

Medical Ethics—Dr. C. R. Christenson, Starbuck.

A discussion followed each paper after being read. The society indorsed Dr. Bolsta's paper containing the proposed bill which will come before the coming legislature known as the Basic Science Bill. Dr. J. D. Weir of Beardsley was designated as director of medical relief in disaster.

The following committee was appointed on publicity: Dr. C. F. Ewing, Wheaton, for Traverse County; Dr. Chas. Bolsta, Ortonville, for Big Stone County; Dr. E. T. Fitzgerald, Morris, for Stevens County; Dr. H. Linde, Cyrus, for Pope County.

The annual meeting will be held at Graceville, Dec. 11, 1926.

WABASHA COUNTY MEDICAL SOCIETY

The members of the Wabasha County Medical Society were entertained Tuesday evening, October 19, by Dr. Arnold Anderson at the Buena Vista Sanatorium, Wabasha. Following the dinner, Dr. J. S. Collins, president of the society, acted as toastmaster.

Dr. J. F. Bond was the first speaker on the program. Dr. William Cochrane read a paper on "The Ethics of the Profession." Dr. Anderson spoke on "The Cure of Tuberculosis" with demonstrations of *x*-ray pictures.

John R. Foley, County Attorney, addressed the Society on the high ideals of the medical profession.

Before concluding the program, Dr. Jesse Slocumb summarized the evening's entertainment with his own definition of fellowship.

THE ASSOCIATION OF CLINICAL TECHNICIANS

The Association of Clinical Technicians is an organization established in 1923 among laboratory technicians in Minneapolis and Saint Paul, which is steadily growing in numbers. The organization has for its objectives: (1) to promote higher standards in clinical laboratory methods and research; (2) to elevate the status of those specializing in laboratory technic; (3) to create closer coöperation between physician and technician; (4) to classify technicians according to ability, training and experience.

Membership, which is by examination, approximates sixty men and women, who are classified into three groups: (A) Those having university or college degree; (B) those having high school training or its equivalent, and who are also graduates of some recognized laboratory course; (C) Those with less preliminary education but six months or more of practical experience. About twenty-five per cent of the membership belong to group A, sixty per cent to B, and fifteen per cent to C.

With sincere gratitude the Association acknowledges real assistance and encouragement, in the past, from many physicians of Minneapolis, but for the future it hopes for yet greater coöperation from others of the medical profession and that every non-member technician be urged to join for the sake of mutual benefits.

President: Mrs. Loren C. Babcock, 1041 12th Ave. S. E., Minneapolis, Minnesota.

Secretary: Miss Mae Deighton, 714 Donaldson Bldg., Minneapolis.

Placement Officer: Miss Eunice Nyholm, 522 La Salle Bldg., Minneapolis.

OF GENERAL INTEREST

Dr. D. E. McBroom of Faribault recently returned from an extended visit in California.

Dr. C. W. Rumpf of Faribault has returned from a three weeks' visit to the clinics in the East.

Dr. and Mrs. William H. Rumpf, Jr., formerly of Ann Arbor, Michigan, are now making their home in Saint Paul.

Dr. Peder A. Hoff and Dr. Alfred Hoff have announced the removal of their offices to 734 Lowry Building, Saint Paul.

Dr. L. B. Ohlinger, formerly of the U. S. Veterans' Base Hospital, No. 68, of Minneapolis, is now located at Rochester, Minnesota.

Dr. and Mrs. T. A. Peppard of Minneapolis have returned from a three weeks' visit in New York, Boston, Philadelphia and Washington, D. C.

Dr. Oscar H. Wolner of Evelcth, Minnesota, has formed a partnership with Dr. Ivar S. Benson, Montevideo, Minnesota, in conducting the Montevideo Clinic.

Dr. E. T. Sanderson of Minneota, who was recently operated upon for appendicitis, is making a good recovery. Dr. F. D. Gray of Marshall, Minnesota, attended Dr. Sanderson in his illness.

Dr. Arthur E. Mahle, who was associated with the Mayo Clinic, Rochester, prior to his removal to Peoria, Illinois, is now located at 30 North Michigan Avenue, Chicago, where he has established a practice.

Dr. Henry W. Grant of Saint Paul and Miss Elizabeth Johnston, daughter of Mr. and Mrs. Frank W. Johnston of Minneapolis were married at the home of the bride's parents, Saturday, November 6, 1926.

Word has been received of the election of Dr. Leon J. Tiber of Saint Paul as president of the American Medical Association of Vienna, where Dr. Tiber is studying surgery, gynecology and obstetrics. Dr. Tiber expects to return to his practice in Saint Paul next spring.

Dr. James J. Barfield has severed his connections with Riverside Sanatorium, Granite Falls, Minnesota, where he has been medical director for the past seven years, and is now associated with Cragmor Sanatorium, Colorado Springs, Colorado, where he will continue tuberculosis work.

Nearly 2,000 school children were given a vaccine against scarlet fever and diphtheria at the first free clinics conducted by the Hennepin County Medical Society Saturday, November 6. The clinics are being conducted in different school buildings in Minneapolis each Saturday from 9 to 11 a. m.

Dr. George E. Brown and Dr. Alfred W. Adson of Rochester, Minnesota, presented the subject "Physiologic effects and surgical applications of lumbar sympathetic ganglionectomy and ramisectomy" before the Minnesota Pathological Society at their meeting in the Institute of Anatomy, University of Minnesota, Minneapolis, Tuesday evening, November 16.

Announcement has been made of the transfer of Dr. George W. Phillips of the regional office of the United States Veterans bureau at Sioux Falls, S. D., to Hospital No. 68, Minneapolis. Dr. Phillips, a tuberculosis specialist, was formerly stationed at the Aberdeen Hospital in Saint Paul, where he was a member of the staff from the time it was opened until 1923 when he went to Sioux Falls.

Dr. J. A. Myers of Minneapolis was elected president of the Minnesota Public Health Association at their annual meeting in Saint Paul, Thursday, November 4. Other officers elected for the year include Dr. O. E. Locken, Crookston, first vice president; Dr. Harold S. Diehl, Minneapolis, second vice president; Mrs. E. L. Youmans, Winona, secretary, and Dr. E. A. Meyerding, Saint Paul, executive secretary.

Under the sponsorship of sixty eminent specialists in children's health, education, and welfare, a new national periodical called "CHILDREN, The Magazine for Parents," has just made its initial appearance with an October issue. "This magazine," it is announced by George J. Hecht, president of the Parents' Publishing Association, New York, under whose auspices it is issued, "will have no propaganda purpose, being dedicated solely to mothers and fathers, for the sake of a new generation of normal, intelligent and healthy children. In this it will have the active coöperation of the leading educational and child welfare agencies, private, public and governmental."

Among the editors of the new magazine are: Miss Julia C. Lathrop, Angelo Patri, Glenn Frank, Judge Ben B. Lindsey, Dr. Livingston Farrand, Dr. Helen T. Woolley, James E. West, Mrs. Sidonie M. Gruenberg, Mrs. Jane Deeter Rippin and Dr. Bela Schick.

The new fireproof addition to the Northwestern Hospital, Minneapolis, made possible through the contributions of Minneapolis citizens, was formally opened in November. Construction was started last year on the new wing. The addition has six floors with room for eighty extra beds, giving the hospital 200 beds in all, besides six sun parlors, six operating rooms and various auxiliary departments.

NEWS FROM THE MAYO CLINIC BULLETIN

Dr. H. J. Fortin, of Fargo, North Dakota, has come to the Clinic as a consultant in the Section on Orthopedic Surgery.

Interurban Surgical Society: The meeting of the Interurban Surgical Society was held in Rochester, November 19 and 20.

Dr. William Robinson, of Sunderland, England, and his son, *Dr. Victor Robinson,* visited the Clinic during the week of October 10.

Dr. K. Hirosaki, of the South Manchuria Railway Company, China, visited the Mayo Clinic during the first week of November.

Dr. Roberto Alessandri, Professor of Surgery, University of Rome, gave a Mayo Foundation lecture on the evening of October 15.

Dr. S. T. Parker announces the opening of offices at 717 Cobb Building, Seattle, Washington, for the practice of dermatology and syphilogy.

Dr. W. Aubrey Crich announces his association with the Lockwood Clinic, Toronto, for the practice of dental radiography and elimination of mouth infections.

Dr. Carl S. Williamson announces the opening of offices, Suite 17 Urquhart Building, Little Rock, Ar-

kansas, for the practice of surgery and surgical consultation.

Dr. Oliver C. Melson, who was formerly at the Mayo Clinic, is now associated with Dr. John R. Dibrell, in the practice of diagnosis and internal medicine, Little Rock, Arkansas.

Dr. Hans C. Jacobaeus, Professor of Clinical Medicine, University of Stockholm, spent several days in Rochester before going to Cleveland to attend the meeting of the Interstate Postgraduate Assembly.

Minnesota Society of Internal Medicine: The newly organized Minnesota Society of Internal Medicine held its first meeting in Rochester on November 8. The membership of this society consists of internists throughout the state.

Dr. and Mrs. S. W. Harrington left Rochester October 19, for New York City and sailed for England November 3 on S. S. "President Roosevelt." They will visit England, Scotland, Holland, Belgium, Germany, Austria, France and Italy, where Dr. Harrington will spend much of his time in the surgical clinics of the large cities. He will remain longest at the clinic of Sauerbruch in Munich and of von Eiselsberg in Vienna. They will sail from Italy in January and return to Rochester the latter part of the month.

Index to Collected Papers: "Index to Collected Papers of the Mayo Clinic and Mayo Foundation" has just been published by W. B. Saunders Company. To quote the foreword, "This General Index of the Collected Papers of the Mayo Clinic and The Mayo Foundation has been prepared in response to a widespread demand. It covers all volumes of articles published from the Mayo Clinic to 1925, including Volumes I to XVI of the Collected Papers of the Mayo Clinic 1905 to 1924, inclusive, Volumes I and II of a Collection of Papers 'Published Previous to 1909,' and Volumes I and II of Papers from the Mayo Foundation and the Medical School of the University of Minnesota. Supplementary volumes are planned for the future." Copies of the Index may be obtained from W. B. Saunders Company, West Washington Square, Philadelphia.

Professor Sauerbruch's visit postponed: A letter has been received from Professor Sauerbruch, of Munich, Germany, stating that conditions have arisen which make it impossible for him to carry out his plans to come to America this fall. He hopes that it will be possible for him to come for several weeks next year.

Speakers from the British Isles: Wednesday, October 13, the program at the meeting of general staff was postponed to give the time to speeches by three distinguished visitors at the Clinic. Mr. Archibald Young, Professor of Surgery, University of Glasgow, Mr. David Wilkie, Professor of Surgery, University of Edinburgh, and Mr. W. Sampson Handley, of London, were the speakers of the evening. Mr. Young and Mr. Wilkie have come to this country to be the guests of the Interstate Postgraduate Assembly at the meeting in Cleveland, and Mr. Handley is one of the authorities on cancer from England who attended the International Cancer Symposium, at Lake Mohonk, New York, in September.

The J. William White Scholarship: On the recommendation of the Medical Graduate Committee the Board of Governors of the Mayo Clinic has awarded the J. William White Scholarship for the Study of Surgery in Foreign Countries to Dr. Estes H. Hargis for conspicuously meritorious work during his fellowship in The Mayo Foundation. This scholarship was made possible by a gift from the late J. William White, Professor of Surgery, University of Pennsylvania; and it is open to physicians who have received the degree of Master of Science from the University of Minnesota for work done in The Mayo Foundation. Dr. Hargis is the first recipient of the award. He is a graduate of the University of Pennsylvania of the class of 1921 and entered The Mayo Foundation as a fellow in surgery in July, 1923. The thesis which he presented in partial fulfillment of the requirements for the degree of Master of Science in Surgery at the University of Minnesota was: "Plethysmographic study of the changes in the volume of the spleen in the intact animal" and his degree was conferred in June, 1926. He will probably sail for Europe early in 1927.

HEALTH DAY PROGRAMS

Four Health Day Programs, given in Southern Minnesota cities the latter part of October, have received much praise from members of the medical profession and laymen for the work accomplished.

With a purpose of acquainting the public with the truth about health they were sponsored by four organization: The Minnesota State Medical Association, the Minnesota Public Health Association, the State Board of Health and the University of Minnesota Medical College.

The Medical Association, through Dr. George Earl, sub-chairman, and Dr. E. A. Meyerding, state secretary, arranged the programs, which were free to the public and largely attended. National publicity, through press wires, was given many of the statements of medical men of the speakers' personnel. This, of course, aided greatly in promulgation of public health education which otherwise might have been much more costly.

Included among the speakers were: Dr. A. J. Chesley and Miss Mildred Smith, of the State Board of Health; Dr. W. A. O'Brien, of the University of Minnesota Hospital; Dr. E. A. Meyerding, of the Minnesota and Ramsey County Public Health Associations; the Rev. H. A. Vernon, Minneapolis; the Rev. W. C. Sainsbury, St. Paul; and Badger Clark, nationally famous poet and lecturer.

Funds from Christmas Seal Sales permitted the defraying of much of the expense of the program as well as the cost of "Chew Chew," the Health Clown, who gave health talks to children in more than a score of schools in that part of the state. The four cities visited were Blue Earth, Worthington, Fairmont, and Pipestone.

Among the doctors who aided committees in the cities visited were:

Worthington: Doctors S. A. Slater, F. M. Manson, C. P. Dolan, B. O. Mork, C. R. Stanley, J. T. Small-

wood, F. G. Watson, and (dentists) A. R. Schmidt, L. R. Gholz, M. F. Cramer, and G. C. Turner.

Pipestone: Doctors W. G. Benjamin, A. H. Brown, Thomas Lowe, E. G. McKeown, H. D. Jenckes, W. E. Richardson, W. J. Taylor, E. S. Perrigo, E. H. Argetsinger, E. E. Argetsinger, S. L. Elliot, and J. E. Schapler.

Blue Earth: Doctors J. A. Broberg, W. C. Chambers, F. W. Logan, C. E. Wilson, and W. A. Demo.

Fairmont: Doctors H. P. Johnson, R. C. Hunt, F. N. Hunt, G. H. Luedtke, W. J. Richardson, V. H. Gardner, H. M. Markin, H. A. Roust, and (dentists) H. L. Bursell, R. H. Zierke, W. G. Tull, K. W. Scott, L. A. Degan, and W. L. Webb.

Because of the unusual success of these programs and the great demand for additional ones throughout the state, there will be a repetition of a large part of the work in three other cities in December.

Cities to be visited will be Brainerd, December 8, Little Falls, December 9, and Saint Cloud, December 10, according to tentative plans.

Health movies, exhibits and musical selections will precede the programs. Subjects to be given in language understandable by laymen will vary from discussion of the benefits of vaccination to pre-natal care and general health education. Motion pictures will supplement the talks.

CHRISTMAS SEALS

One of the happiest expressions of the true Christmas spirit that the holiday brings is the broadcasting of tuberculosis Christmas Seals. These attractive little tokens bearing the double-barred cross, international insignia of the anti-tuberculosis campaign, are again on hand to brighten our Christmas mail and on all sides we hear the appeal "Buy Christmas Seals—fight tuberculosis."

Minnesota physicians are particularly interested in the success of the seal sale this year because of the close coöperation existing between the State Medical Association and the Public Health Association, which is entirely financed by the penny stamps. A series of health days, in which these two organizations coöperated, held during the year demonstrated the effectiveness of the Associations working hand in hand, and more extensive coöperative efforts are planned for the coming year.

For nineteen years penny seals have provided revenue for the local, state, and national battle to beat back the great White Plague. From the laboratories of our great universities, where research work for a specific cure for tuberculosis is sponsored by the National Tuberculosis Association, to Minnesota's remotest villages, where free clinics and school health educational work are conducted, the penny stamps carry on their unceasing campaign against the enemy.

The tuberculosis death rate has been cut in half in the past twenty years, but the fight is still far from done. In Minnesota alone the White Plague killed 1,586 people in 1925, and authorities estimate that there are now over 14,000 active cases in the state.

We can all have our modest share in the job of disseminating information about tuberculosis by investing a few dollars in Christmas Seals, and help in extending the practice of using them on all holiday mail.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

SOME ASPECTS OF HYPERTENSION*

HENRY L. ULRICH, M.D.
Minneapolis

It is within this generation of physicians that the term essential hypertension (hyperpiesia of Albutt) has emerged from its nebulous haze into a definite clinical syndrome, standing clear and unashamed in its havoc of terminal events—cardiac failure, vascular accidents, encephalomalacia and renal insufficiency. Arteriosclerosis as a cause has been properly adjudged as an effect. Only in the last decade has the vascular kidney been separated from the contracted kidney of Bright's disease. The importance of these ideas is difficult to exaggerate. As they become more common they bring out the general impression that this functional condition is on the increase.

On the heels of this clarification there comes the usual question as to the cause or causes for this clinical syndrome. I will wave aside the speculative features which are usually hinted at in this discussion, such as the stress, hurry, and habits of our modern life. Nor will I indulge in the delightful speculation on the relative merits of the antipodal racial, social, psychic and dietary differences, if these are factors, in explaining hypertension in the Occidental in contrast to its absence in the Oriental.

Your own histories, as well as O'Hare[1] in this country, and numerous writers on the continent have called attention to the factor of inheritance (the genotypic factor) in hypertension. From 50 to 60 per cent of hypertensives give familial history. Of the paratypic factors, the psychogenic, the hormonal, and the toxogenic are given primary importance. These acting singly or in interplay, or in interference; or their action on or in interference with the gens of inheritance can produce hypertension. We must admit that this is a backhanded explanation of hypertension. It recognizes a constitutional habitus. It merely states that clinically we have seen psychogenic hypertensives who have improved under psychotherapy. We have seen a larger group of women, in normal climacteric or precox state, which has exhibited hypertension following cessation of ovarian function, and in which the pressure was influenced by proper hormone therapy. Again we have seen another large but less obvious group, to whose tension we have attributed a disturbance of metabolism. These clinical assumptions in no wise give us a true picture of the mechanism of the change.

There must be a physiology of hypertension (see Chart I). Briefly the vasomotor apparatus consists of a center, probably in the medulla, the nerve fibres made up of the vegetative system, the muscles being the smooth muscle cells in the arterioles of the precapillary

*Presidential address read before the Minnesota Academy of Medicine, Sept. 15, 1926.

CHART I.

TEMPORARY SCHEMA OF VASOMOTOR APPARATUS

CENTRAL BRAIN STEM	1. *Afferent Impulses* Psycogenic Peripheral Afferent nerves of the aorta viscera and muscle 2. *Local Changes* Intracranial pressure Nutrition-arteriosclerosis Endocrine substances Tissue extracts Drugs
EFFERENT FIBRES AREA OF NEURO-MUSCULAR JUNCTION	Injury—Accidental or Surgical Endocrine Products Tissue Extracts
MUSCLE CELLS IN PRECAPILLARY AREA	1. *Substances Affecting Changes in Metabolic Processes.* Tissue extracts Endocrine substances Drugs 2. *Substances Affecting Tonus by Changes in Phases of Cell Membrane* Cholesterin

area. Granting the variations in activity of the center, and changes in function of the fibres, the mechanical result (pressure) lies in the function or dysfunction of the muscle cells in the precapillary areas. The allied states such as vascular crises and Raynaud's disease, may be an expression of central or peripheral nerve dysfunction; in essential hypertension the possible change in the physiology of the individual muscle fibres must be emphasized. Of the many forms of stimuli which lead to rise in blood pressure there appear to be three leading conditioning causes for hypertension (omitting for the moment the nephritic type), vasomotor instability, hormonal changes, and primary changes in the physiology of the muscles themselves. This changed state leads to an increased response to stimuli and a new state of tonus, so that relaxation is not commensurate with contraction. Pal[2] in a discussion of the physiology of muscle of hollow organs such as the intestines, bladder and blood vessels, calls attention to the importance of tonus to their function. If one empties a bladder normally the state of the muscle of the viscus is relaxed; if one empties the bladder by catheterization the muscle is not wholly relaxed; if it is emptied against resistance, the muscle of the viscus is in a state of marked contraction. Each one of these states is a tonus following its respective stimulus. In all muscles, smooth or striated, there is a kinetic contraction following a stimulus, and a state of tonus following this, which may or may not be the same as before the kinetic activity. Physiologists, in studying the function of tonus, call attention to the tonus of muscles in bivalves. After closing, the muscle holding the valves together will continue to do so for days and weeks without loss or the consuming of any energy as measured by oxygen exchange. Some analogous process must occur in the fixation of the tonus of the muscles in the precapillary areas in hypertension. Fixation of function to a perverted form is not a new concept in medicine. Auricular fibrillation is a functional change in the heart muscle. Even with quinidine fixation occurs in 50 per cent. That a person can go on with this change in his physiology for ten, twenty or thirty years is as startling and puzzling as is the idea of a change in the vasomotor apparatus for an equally long period. Westphal[3] has called attention to a perversion of function in his paradoxical reaction of the peripheral vessel to certain stimuli. He obtains this reaction by compressing the brachial artery for one minute, then suddenly releasing the pressure. In normal cases the capillaries as seen under the microscope are filled with blood—there is a plethora of the capillaries and peripheral vessels due to dilatation. In the hypertensive the reverse is seen. Instead of dilatation a constriction is noted. What capillaries are seen, practically disappear. The mechanical stimulus of the sudden rush of blood in the brachial and its branches induces a contraction of the capillary and precapillary areas.

In the two great classes of hypertension, that of the nephritic and the essential group, we now know that the anatomic bases are different. The cause of pressure in nephritis is not as yet definitely settled. The retention of abnormal products of metabolism has been designated as a factor. How and where they act is not clear. The compensatory contraction in the precapillary bed of the kidneys may be the explanation. Aside from the question whether nephritis is a purely renal or generalized tissue (capillary) disease the recent observations of Blackfan[4] in acute glomerular

CHART II.

31 CASES WITH HYPERTENSION
DIASTOLIC BELOW 110

NAME	AGE	REMARKS	BL.PR.	CHOLESTEROL
Roxsberry	68	Possible Decomp. Hyper.	120/80	98 mg.
Urabic	67	Hypertension Decomp.	156/98	128
Urabic	67	Hypertension Compensated	156/94	200
Rogers, L.	72	Hypertension Decomp.	90/70	146
Morley	54	Auric. Fib. Comp.	160/80	153
Swenson	57	Hypertension Compensated	130/100	150
			122/64	
Gausman	63	Decompensated	170/100	154
Zimmerman	52	Hypertension Compensated	172/100	162
Schwartz	65	Hypertension Decomp.	180/90	165
Boardman	63	Hyper. Decomp. Diab.	160/90	167
Russel	55	Toxic Adenoma Exoph.	196/108	170
Beasley	69	Fluid in Rt. Base	160/100	170
Dover	78	Auric. Fib.	210/100	179
Wallace	60	Hyper. Decomp.	122/90	180
Swingley	53	Hypertension ?	224/108	184
Bannon	45	Decompensated	160/100	190
Hyams	48	Hypertension Decomp.	96/58	
			160/100	190
Johnson	49	Hypertension	180/64	191
Stephens	58	Hyper. Comp.	160/88	191
Anderson, J.	45	Rheum. Fever Hyper.	192/96	195
Oniel	71	Fairly Well Compensated	188/108	198
		Compensated	150/90	198
Halverson	33	Hypertension Compensated	165/90	200
Runstrom	50	Cong. of Lobes	144/100	200
Barron	21	Pleural Effusion	160/102	200
Bloomberg	46	Hypertension	192/104	205
Stein	67	Hyp. G. B. Jaundiced	194/86	221
Slingerland	57	Diabetes, Comp.	164/102	224
Smith, Ann	67	Hypertension	172/94	232
Anderson	53	Edema of Ankles	148/100	240
Tomlinson	67	Mildly Decompensated	140/104	243
Reeves	60	Cong. at Bases	200/100	290
Joax	83	Compensated	150/100	300
(19) Hyper 61.+%		(11) Ortho 35.5%	(1) Hypo 3.%	

nephritis of children is of interest. In children all the factors usually attributed as causes for hypertension can be ruled out. He noticed the rise of blood pressure always was associated with increased intracranial pressure, independent of the severity of mildness of the renal lesion (as judged by the urinary findings and the retention products in the blood). This intracranial pressure was due to edema. When the edema of the brain was relieved by changes in osmotic tension following the intravenous injection of hypertonic salt solution or the hyptonic solution of 1 per cent magnesium sulphate, the fall of the blood pressure was immediate. The appearance of the brain in acute glomerular nephritis is quite different from the appearance of the brain in tubular nephritis, the so-called nephrosis of Volhard and Fahr. In the former the convolutions are being obliterated, in the other they are preserved. Whether the absence or presence of pressure in these respective diseases is due to different types of edema, intercellular or intracellular, is not clear. The hypertension in acute glomerular nephritis of children is a compensatory affair to counteract intracranial pressure—a life saving process. Whether this idea is applicable to the subacute or chronic forms of glomerular nephritis of adults remains to be seen.

The presence of pressor substances has been searched for in the circulating blood of hypertensives. In this country Major[5] has observed in two cases of hypertension increased excretion of guanidin bases in the urine, with fall of blood pressure during diuresis following the use of digitalis and caffeine. Experimentally he[6] has been able to increase blood pressure by injection of guanidin compounds in dogs. Howard and Robinowitch[7] were unable to find guanidin bases increased in the circulating blood of hypertensives. In fact they found them more often decreased than in normals. They were able to find an increased excretion of guanidin compounds in the diuresis induced by calcium and potassium chloride in hypertensives. The rise of pressure following the injection of hormone such as adrenalin and pituitrin are old established facts. Their presence or the finding of increased amounts of these substances in the circulation in hypertensives has never been demonstrated.

The feeding of cholesterin to rabbits by Anitschkow[8] and others, to bring about arterial changes such as atherosclerosis, brought out the interesting fact that it also induces prolonged rises of blood pressure. Westphal[9] was able to corroborate this observation. He then attempted to demonstrate the action of cholesterin on the isolated arterial strip. The experiments gave beautiful demonstrations of the influence of cholesterin on the contraction of the smooth muscle in the arterial wall. The contraction of the strip immersed in Ring-

CHART III

CASES WITH HYPERTENSION
DIASTOLIC 110 OR OVER

NAME	AGE	REMARKS	BL.PR.	CHOLESTEROL
Carpenter, H.	56	Arteriosclerosis	180/125	110 mg.
Becker	85	Hypertension Decompensated	150/110	134
Becker	85	Hyper. Early Decompensated	200/110	219
Roby	65	Hyper. Far Advanced Tbc	210/120	140
Powers, Lucy	51	Decompensated	150/120	145
Wilson	47	Diabetic, Comp.	180/130	160
Dahlstrom	67	Hyper. No Decomp.	210/140	167
Rollins, H.	58	Hyper. Comp.	210/120	169
Bannarn	45	Mildly Decomp.	165/110	173
Nelson	67	Decompensated	175/110	181
St. John, Martin	52	Hyp. Cardiac Hyper.	166/110	184
Jones, Anna	18	Hyp. Renal Involvement	220/130	185
Heyman, Mary	52	Hyp. Lues	252/140	188
VanBuren, Geo.	48	Hypertension	228/128	191
			246/120	
Smilowitch	55	Hyp. Cardiac Hyper.	230/112	191
			230/112	220
Jacobson	63	Hyp. Not Decomp.	200/110	195
Dale, Winifred	45	Hyp. Cardiac Hyper.	166/110	196
Glackner, V.	72	Hyper. No Decomp.	170/110	197
Mawn	54	Hyp. Markedly Decomp.	194/150	200
Nelson	67	Hyp. Decomp.	168/116	200
Noble	79	Hyp. No Decomp.	220/140	200
Anderson	58	Decompensated	190/120	201
Bethel	50	Comp. Hyper.	178/110	210
Bradfield	48	Compensated	170/130	210
Farrington	73	Hyp. Decomp. Hydrothorax	185/130	210
Gacke, J.	42	Hyper. Lues	210/150	210
Gacke, J.	42	Hyper. Lues	210/150	220
Palmer	58	Diabetic, Hyper.	164/110	213
Allan	72	Hyp. Markedly Decomp.	164/120	214
Lewis	60	Hyper. Decomp.	194/114	214
Olson	63	Hyper. No Decomp.	210/130	217
Peal, Leah	46	Hyper. Parox. Tachy.	188/134	217
Murray	67	Effusion at Right Base	160/120	222
Solberg, Elida	63	Hyper. Cerebral Hem.	196/128	227
Thompson	66	Hyper. Congest. of Bases	260/160	230
Gilmore	70	Hyper. Decomp.	246/134	240
Biemal	53	Early Decomp.	216/110	260
Biemal	53	Mildly Decomp.	216/110	242
Olson	65	Hyp. Early Decomp.	220/132	244
Lukosky	43	Hyper. Cardiac Asthma	160/110	256
Somers, J.	45	Hyper. No Decomp Renal Involvement	230/160	250
Cloud, Della	42	Hyp. Mild Decomp.	242/132	254
Ingraham, J.	42	Decompensated	184/142	333
Weik	54	Diabetic, Hyper.	184/114	400
(34) Hyper. 80.9%		(7) Ortho 17%	(1) Hypo 2%	

er's solution properly buffered with serum colloids showed a marked difference from the one immersed in a similar fluid without cholesterin. There was a stronger and more prolonged reaction to stimuli, such as adrenalin or oxygen, with an increase of tonus lasting twelve to fourteen hours. In the uncholesterinized strip the reaction was prompt and the relaxation equally as rapid.

Overton and Meyer[10] have shown the significance of lipoids for cell membranes. Colloids, lecithin and cholesterin play an important part in the physiology of the individual cells of the body. Cholesterin outside of fat is the only non-water-soluble substance in the body. Its relation to cell metabolism is of extreme importance. Lecithin and cholesterin are antagonistic in this connection. Lecithin is hydrophilic; cholesterin is hydrophobic. Briefly, Westphal's argument, to which he brings an array of collateral facts, is that cholesterin changes the physico-chemical phases of cell activity by modifying the cell membranes, thereby affecting the exchange of ions, gases and water. The action on the cell membrane surrounding the muscle cells in the arterioles modifies the internal activity of the cells to such an extent that their reaction to stimuli and their tonus is entirely on a different basis. He concludes that cholesterin is a tonogenic substance to smooth muscle. He observed further in arterial strip experiments the absorption of cholesterin. The cholesterin content of the arterial strips immersed in cholesterin had increased.

The French have called attention to the increased cholesterin contents in the blood of hypertensives, nephroscleroses and pregnant women, associated with a high cholesterin content in the adrenals. Westphal[11] reports 71 per cent of the cases hypertension show hypercholesterinemia. Of the remaining 29 per cent the larger number were high normals. Only a few with decompensation and edema or cachexia showed a lower level than normal. Cholesterin is the only metabolite

CHART IV.
NON-HYPERTENSIVE CASES

GROUP OF NORMALS: 20-30 yrs. old	B.G.	180 mg.
	A.G.	161 mg.
	E.C.	170 mg.
	V.A.	165 mg.
	L.K.	180 mg.
	V.S.	150 mg.
	R.B.	135 mg.
	E.S.	160 mg.

NAME	AGE	REMARKS	BL.PR.	CHOLESTEROL
Tibbets	56	A.I.	190/68	139 mg.
Hunezok, Jennie	38	Rheumatic Fever		144
Fletcher	25	A.S.	118/42	150
Hicks	69	Hemiplegia	185/75	162
Oseng	24	M.I.	118/88	170
Campbell	18	Pleural Effusion	116/68	170
Nelson	30	A.I.	140/50	175
Deinhardt	60	A.I.	140/50	185
Elliott	53	Aortic I.	128/76	186
Down	15	M.I.	122/76	190
Mattock	63	Luetic Aortitis	134/66	195
Thompson	22	Diabetic		198
Kroff	56	A.S.	104/78	214
Dragon	19	Diabetic		225-28-30
Kraft	62	Aortic Aneurism, A.I.	152/85	255
Halverson	37	S. Anemia; Cancer of Liver	140/84	476
Johnson, Alex	63	P.A.	86/40	65
Johnson, Axel	81	P.A.	110/50	66
Lewis, Mary	62	P.A.		71
VanLannen	56	P.A.		76

A.S.—Aortic Stenosis; A.I—Aortic Insufficiency; M.I.—Mitral Insufficiency; S.A.—Secondary Anemia; P.A.—Pernicious Anemia.

so far which has been found increased or changed from its normal level, with any degree of consistency or regularity, in hypertension. Following the experiments with arterial strip and the consistent finding of hypercholesterinemia in hypertension, Westphal feels justified in the assumption that it is a tonogenic substance and that it is in close relation to the production of this functional change.

In allied states of arterial derangements, such as vascular crisis, migraine, gout, and even diabetes, hypercholesterinemia is a fairly constant finding. The hypercholesterinemia of diabetes may be on an entirely different basis than that of hypertension. Here the associated lipemia may be a factor in the flooding of the blood. There is a closely associated valence of fat and lipoids. Their physiological chemistry is not as yet wholly known. In severe anemias, fevers, and hypotension there is a hypocholesterinemia.

There are conditions in which there is hypercholesterinemia without a rise of blood pressure. The nephroses are the most striking of this group. The heaping up of cholesterin in the blood in this disease is particularly high. In fact it is used as a diagnostic procedure to separate it from the nephritides. In true nephritis there is no hypercholesterinemia. The physico-chemical states of nephrosis and hypertension are markedly different. The water imbalance, the tendency to swelling of the tissues, the shifting of the colloids of the blood, and the reduction of ions are entirely opposite to that of hypertension. In nephrosis when the edema disappears the cholesterin sinks to its normal level. This is in contrast with the hypertensives in whom the cholesterin contents decrease when edema appears. The mechanism for the rise and fall of cholesterin in the one must be opposite in the other. There is a marked difference in the fixation of the cholesterin. In hypertension it is fixed loosely to the albumin fraction; in nephrosis it is fixed to the globulin and fibrinogen fractions of the serum. The intravenous injection of an appropriate dose of adrenalin produces a marked rise of blood pressure in hypertension. In nephrosis the response to the same dose is sluggish and far below that in the normal.

Pregnancy is another state in which hypercholesterinemia is found. The resemblance of the physico-chemical shifting of the colloid, water, and salt, in this condition aligns it closely in this sense to the nephroses.

The concept that abnormal manifestations of function are due to physico-chemical derangement is not new. In hypertension there may be either changes in ionic chemistry, or hormonal imbalance, or vasomotor instability; and that any one of these, plus the heaping up of cholesterin, may produce changes in contraction and tonus of the blood vessel walls, is comparatively new. That some such variation from stability is essential before cholesterin can play its part is quite obvious. We can conclude therefore that hypertension is the result of a number of factors, vasomotor instability, hormonal changes and perverted physico-chemical processes. Abstractly speaking, then, given a number of variables acting antagonistic or synergistic on a constant —that is a changed physico-chemical state of the smooth

muscles of the arterioles—produce hypertension. The treatment of the condition testifies to this most eloquently. Rest, psychotherapy, hormones, drugs, tissue extracts, change of diet, including salt, blood letting and lumbar puncture, all have produced changes in pressure.

Since the beginning of the year I have had examined the blood of 72 cases of hypertension for cholesterin. The findings corroborate Westphal's data. We get 74.4 per cent hyper; 23 per cent ortho; and 2.6 per cent hypo. We have used Bloor's method. Westphal estimates the cholesterin in the plasma. We have used whole blood. The problem was merely to see if there was a hypercholesterinemia. The variations and their causes are to be examined later (see charts). Arbitrarily I have divided the cases into two groups: one in which the diastolic pressure is 110 or over, the other in which the diastolic is under 110. There were forty-one in the "110 or over" group and thirty-one in the "below 110" group.

In closing let us review briefly what is known of cholesterin metabolism.[12] Its origin is in the food. It is absorbed as an ester and circulates in the blood, two-thirds as an ester, one-third as a free state. Its level in the blood is fairly constant. Its excretory organ is the liver. The ovary, gonads and adrenals are repositories. It is found in the bile in a free state varying from 2 per cent to 6 per cent. It is changed by saprophytes in the bowels to croprosterin. Another portion is reabsorbed. It is suspected that bile acids are formed from cholesterin. While oxidative evidence is at hand it is not a source of heat. It is present everywhere in the body. There is some evidence that there is an endogenous formation. Its characteristic property is to resist mixture with water, and according to its concentration to influence the cell membranes of the body and to absorb poisons. Cholesterin balance is only obtained by means of intestinal digestion. Fat is necessary for its solution. Besides insufficiency of the liver as a source of retained cholesterin there are: mobilization of lipoids in nephrosis; ether narcosis; and infection. In pregnancy there is a rise of cholesterin in the blood with a corresponding fall in the bile. After labor there is a reversal of the curves to normal.

The high content of cholesterin in the blood of hypertensives as far as can be determined must be assumed to be due to liver insufficiency. In this connection the use of liver extracts to reduce tension has been of acute interest within the last few years. Major has been able to make a liver extract which is free from choline, histamine or peptone. MacDonald's[13] extract contains no protein derivatives. These men so far have been satisfied with reports of blood pressure curves following the use of these extracts. How or where they act in reducing tension has not been mentioned. Their successful reports again emphasize the possible rôle the liver plays in regulation of metabolic processes. My next effort in the study of this functional condition will be in seeing what effect the injection of these extracts has on the cholesterin level of the blood; and in cases where there is hypercholesterinemia to see what effect diet, rest, and variations of ions will have on cholesterin levels.

BIBLIOGRAPHY

1. O'Hare, J. P.: Jour. Am. Med. Assn. July 5, 1924.
2. Pal, J.: Wein. Med. Wchschft. 1919, 2111.
3. Westphal, K.: Zeitsch. f. Klin. Med. 1925, 101, 545.
4. Blackfan, K. D.: Bull. Johns Hopkins Hosp. 1926, 39, 169.
5. Major, R. H.: Bull. Johns Hopkins Hosp. 1925, 36, 357.
6. Major, R. H., and Stephenson, W.: Bull. Johns Hopkins Hosp. 1924, 35, 140 and 35, 186.
7. Howard, C. P., and Rabinowitch, I. M.: Jour. Clin. Invest. 1926, 2, 587.
8. Anitschkow, N.: Beit. Path. Anat. und Allg. Path. 56, 379.
9. Westphal, K.: Zeitsch, f. Klin. Med. 101, 586.
10. Overton and Meyer: Citation from Westphal K. u. Hermann, F. Zeitsch. f. Klin. Med. 101, 566.
11. Westphal, K.: Zeitsch. f. Klin. Med. 101, 586.
12. Abstract from Westphal, K.: Zeitsch. f. Klin. Med. 101, 586.
13. MacDonald, W. J.: Proc. Soc. Exp. Biol. and Med. 22, 483.

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TRANSACTIONS OF THE MINNEAPOLIS SURGICAL SOCIETY

The regular November meeting of the Minneapolis Surgical Society, given over entirely to a dry clinic, was held at the Minneapolis General Hospital, on November 18, 1926. Dinner was served at the hospital before the meeting, through the courtesy of Dr. Walter E. List, Superintendent.

The meeting was called to order by Dr. Robitshek, President, and turned over to Dr. Zierold, who had arranged the clinical program. The following cases were presented:

Case 1.—A girl thirteen years old was admitted to the hospital in March, 1926, complaining of pain in the right lower abdomen, radiating to the right shoulder and right side of the chest, and accentuated by any sudden movement. Pain had begun suddenly in the night three weeks previously. Vomiting and obstipation occurred for several days after the onset. There was a history of a severe fall as a baby. For as long as she could remember she had had attacks of vomiting, accompanied by abdominal cramps and with constipation, and periods of dry cough. *X*-rays of the chest confirmed by barium meal and barium enema demonstrated a diaphragmatic hernia through right diaphragm containing part of the transverse colon. Pneumothorax was well tolerated and showed the absence of adhesions between the hernia and the visceral pleura. At operation by Dr. Zierold, a flap of the lower right chest wall was turned laterally, the sac opened, adhesions separated and the colon dropped back into the abdomen; the opening in the diaphragm was repaired and the chest wall closed. There was a temporary sterile hemothorax after operation, the recovery being

otherwise uneventful. Patient, as can be seen, is now in very good health.

Cases 2, 3 and *4* formed a group of cases of duodenal ulcer, presented by Dr. Cranmer as a basis for his discussion of the various types of operation used. The first was a case of simple duodenal ulcer coming to operation because of financial inability to complete a proper course of medical treatment. The ulcer was not sufficiently close to the pylorus to permit a typical Horsley pyloroplasty. Excision was performed by elliptical longitudinal incision in the duodenum and closed in a transverse direction, using the Horsley type of suture. The incision was extended proximally far enough to sever the pyloric sphincter. Gastro-enterostomy was not done. There was a general informal discussion of the various steps of this operation.

The second case was a penetrating ulcer very close to the pylorus. A Finney pyloroplasty was performed.

In the third case, operated by another member of the staff, a Billroth I operation was performed. All three patients have been markedly benefited by their treatment; they are entirely free from discomfort now.

There was a general discussion by the members present as to the various operations for duodenal ulcer, their modifications, and the indications for each.

Case 5.—A boy, five years old, in April, 1924, suffered a fracture of the left femur. A month later there appeared a purulent infection of the knee joint, without bone involvement. Dr. Zierold opened the knee joint by a longitudinal lateral incision and the patient was then treated according to Wilm's method. The patient is able to demonstrate that he can run around normally.

Case 6.—This case was presented by Dr. T. H. Sweetser to illustrate a method of differential diagnosis applicable to certain obscure cases. A man fifty-nine years old had pain in the right lower abdomen and rectum. At rectal examination a hard very firm mass, apparently a stone, could be felt in the location of the right seminal vesicle. Roentgenogram showed a shadow in this location but it could not be decided whether the stone was in the seminal vesicle or in the stump of the right ureter. A nephrectomy had been performed ten years ago. Cystoscopy showed obliteration of the right ureteral meatus. To settle the difficulty an injection of sodium iodid was made into the right vas deferens by the Bellfield method, roentgenogram being made at the same time. A beautiful picture was obtained showing the vas deferens, seminal vesicle and ejaculatory duct; the shadow of the stone was shown to be in contact with but outside the shadow of the seminal vesicle. The right ureter was later removed and found to be markedly dilated and surrounded at the lower end by fibrous and inflammatory tissue.

Case 7.—A case of hypernephroma with metastases. Roentgenograms and a microscopic section from one of the subcutaneous metastases were shown. The microscopic section gave the first indication of the location of the primary tumor; cystoscopy and pyelogram completed the diagnosis. Dr. Watson, the hospital pathologist, discussed this and other types of tumor in which a diagnosis can and often must be made from the character of the metastatic nodules. Dr. Ude, the roentgenologist, presented the roentgenograms and discussed the distribution of metastases in this type of tumor. There was a general discussion of these problems.

Case 8.—This case of acute gangrenous appendicitis, with perforation and abscess formation, was presented by Dr. Regnier because of the severe post-operative complication. Twelve days after operation the patient had fever and signs of beginning pneumonia in the right lung. Dr. Ude presented a series of beautiful roentgenograms showing the hilum type of pneumonia, the gradual development of an abscess in its center, the gradual complete resolution of the pneumonia, and the collapse and disappearance of the abscess. The patient was treated by the postural drainage method, being placed on the sound side face down with the foot of the bed elevated one to three feet, three times a day. Dr. Regnier discussed the various methods of treatment that might have been used had the abscess not disappeared under the treatment given.

Case 9.—A chronic, perforating, duodenal ulcer with almost complete pyloric obstruction and with blood persistently present in the stools and stomach contents. Dr. Regnier performed a posterior isoperistaltic gastro-enterostomy as close to the pylorus as possible. The patient has made an excellent recovery, has gained thirty-five pounds in the past three months, and takes a fairly liberal diet without distress. Several badly infected teeth have since been removed. Dr. Regnier discussed the advisability of placing the gastro-enterostomy close to the pylorus and showed roentgenograms of the post-operative course in support of his contention. Resection of the ulcer, he said, would have been the operation of choice in a bleeding, perforating, duodenal ulcer, but it was found at operation that resection of this particular ulcer would have been impossible.

Case 10.—A case of penetrating ulcer on the lesser curvature of the stomach with a fairly large pocket and very little six hour retention of barium in the stomach. Dr. Regnier performed a "V" shaped resection with a cautery by the Balfour method; gastro-enterostomy was not done, there being no adhesions or pyloric obstruction. The patient went home four weeks after the operation and has gained ten pounds in weight. *X*-ray studies since the operation have shown some persisting but decreasing deformity at the site of the ulcer; the patient feels well, and it is thought that this deformity will probably disappear. The stomach empties normally. Regulation of the patient's diet is being continued, with a modified Sippy regime. Dr. Regnier emphasized the importance of pre-operative medical treatment and continuance of the medical treatment for at least six months or a year after operation.

Dr. Ude discussed the roentgenographic appearances after various operations on peptic ulcers of the stomach and duodenum.

Dr. McPheeters told of a case illustrating the great value of the gastro-enterostomy when there is pyloric obstruction.

Dr. White discussed the importance of pre-operative medical treatment, stating that it often incomplete and ineffective unless very strictly carried out and frequently checked by aspiration of the stomach. He told of a patient in whom there was a very surprising and complete disappearance of the deformity in the stomach

outline during a course of strict Sippy management. He also emphasized and illustrated the importance of eliminating all foci of local infection from such patients.

Dr. Robitshek spoke of the necessity of modifying the type of treatment according to the status of the patient as well as according to the type of ulcer.

Executive session was held after the adjournment of the scientific meeting.

THEODORE H. SWEETSER, M.D.,
Secretary.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS

ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

CHOREA TREATED WITH INJECTIONS OF MILK: A. Hymanson, M.D. (Archives of Pediatrics, October, 1926). Non-specific protein therapy has been successfully applied in many diseases in adults and in not a few in children. The remedy is believed to owe its action to acceleration of metabolic processes and incidental stimulation of the defensive forces of the body. Careful observers have shown that parenteral injections of any sort of protein into animals, whether normal or diseased, and even in minimal doses, will cause an increased elimination of urea and CO_2. In animals infected with certain pathogenic microbes, as those of typhoid fever, an injection of protein results in an increase in the formation of antibodies and agglutinins after an initial leucocytosis especially marked as to neutrophiles. There is an increase in blood platelets, fibrinogen, thrombokinase and blood sugar. All of the secretions of the body are increased and muscular efficiency is augmented in the frog, including the action of the heart.

The non-protein therapy has been carried out especially with intramuscular injections of boiled milk in all forms of disease because this substance is readily available, inexpensive, easily sterilizable and comparatively free from unpleasant collateral effect.

The average duration of chorea is given as from 11 to 13 weeks. This is at least twice as long as these cases treated required. The results obtained in chorea by milk injections were very satisfactory and the treatment can be recommended.

R. N. ANDREWS, M.D.

THE INCIDENCE OF ENDOCARDITIS IN EARLIEST CHILDHOOD: Paul D. White, M.D. (Amer. Jour. of Diseases of Children, October, 1926). Endocarditis in infancy is rare, but even during the first year of life it may occur, and when it does it appears to be more often associated with infection of "septic" nature rather than with rheumatic infection.

Acute articular rheumatism and chorea are very rare in infancy, but increase progressively in frequency after the age of 2 years. It is to be remembered that often very mild rheumatic infections and even rheumatic carditis alone may occur in early childhood.

Endocarditis after the age of 2 years becomes more common, and is much more likely to be associated with rheumatic rather than with septic infections as the child grows older.

Many cases of endocarditis in early childhood are of unknown cause, and doubtless account for much of the chronic valvular disease of obscure etiology found in older children at school age and after, and in young adults. It is probable that the largest percentage of these doubtful cases result from unrecognized rheumatic infection, often very mild, and sometimes affecting the heart alone. It is possible that some of the doubtful cases may result from septic infection in infancy or afterward.

Careful observation of the condition of the heart at birth, and during and after every infection in early childhood, is an important measure in the collection of data for the analysis of the large group of cases of endocarditis of unknown origin. Even a slight rise of the temperature above normal or unexplained malaise may mean endocarditis in a child, particularly in the climate of northeastern United States where rheumatic infections are so common and so serious, especially in crowded damp homes in the winter and spring. The presence or absence of a family history of rheumatic infections should always be determined; it appears to be of considerable importance.

It is possible that in some cases endocarditis may develop in children very insidiously, with no evident infection to call attention even to the need of medical advice. Routine physical examination, such as is now becoming the practice is the case of many adults annually, would detect such endocarditis in its early stages.

Young children with rheumatic endocarditis rarely die, and so necropsy findings revealing early or relatively slight mitral valve involvement are rare. Clinically one finds the loud systolic murmur of mitral regurgitation often preceding the diastolic murmurs of mitral stenosis and of aortic regurgitation in the date of discovery.

R. N. ANDREWS, M.D.

ROENTGENOLOGY

SUPERVISORS:
LEO G. RIGLER,
MPLS. GEN'L HOSPITAL, MINNEAPOLIS
A. U. DESJARDINS,
MAYO CLINIC, ROCHESTER

THE RELATIVE VALUE OF CHOLECYSTOGRAPHY AND THE SO-CALLED DIRECT AND INDIRECT METHODS OF ROENTGENOLOGIC EXAMINATION OF THE GALLBLADDER: Case (Am. Jour. of Roent., Sept., 1926). The intravenous method of administration of the tetraiodophenolphthalein is strongly advocated. The author finds that he can make it a safe office procedure which gives him a maximum amount of information as compared with all other methods. It has the very great advantage over the oral in that a definite dose of the dye has been positively introduced into the blood stream, thus eliminating the question of failure of capsules to dissolve or of incomplete absorption of the dye. Therefore failure to visualize the gallbladder is almost positive evidence of pathology, and has been confirmed in 95 per cent of the author's cases by operation. In this method variations from normal intensity of the gallbladder shadow can also be given significance as indicating disease, which is a very unreliable finding with the oral method.

The indirect signs of gallbladder disease in use before the introduction of cholecystography are evaluated, and the following given importance as strongly suggestive of gallbladder pathology: (1) Visualization of the duodenum beyond the duodenal bulb; (2) an inconstant deformity of the duodenal bulb; (3) spastic manifestations in the stomach or bowel, or both; (4) spastic manifestations in the stomach in the absence of a demonstrable gastric or duodenal ulcer. Discredit is thrown on the interpretation of elliptical shadows in the right upper quadrant as due to the gallbladder unless confirmed by the dye method. The author finds even jaundice not a contraindication to this method.

The technic of the intravenous administration of the dye is described in detail, and reproductions of characteristic findings are shown.

WALTER H. UDE, M.D.

THE ROENTGEN-RAY TREATMENT OF KELOID: Grier (Am. Jour. of Roent., July, 1926). The author has had uniformly satisfactory results in the treatment of keloids with unfiltered roentgen rays. An 80 to 90 per cent skin erythema dose is given at each treatment, and an interval of eight weeks is allowed to elapse between treatments. In estimating the above dose, attention is carefully given to the size of the area to be treated. The author finds that the factors which he uses will produce a faint erythema in an area ¼ in. square in seven minutes, while they produce a similar reaction in an area 2 in. square in three minutes. Total number of treatments seldom exceed 4 to 5.

WALTER H. UDE, M.D.

THE RELIABILITY OF CHOLECYSTOGRAPHY BY THE ORAL METHOD AS SHOWN BY AN ANALYSIS OF ONE HUNDRED CONSECUTIVE CASES: Stewart and Ryan (Am. Jour. of Roent., Sept., 1926). The authors are advocates of the intraoral method of cholecystography, and are very emphatic in their assertions that this method properly carried out is just as reliable as the intravenous method of administration of tetraiodophenolphthalein. The oral method is favored by them because it has the great advantage of simplicity, lack of severe reaction and danger to the patient, and can be used as a routine office procedure with absolute reliability.

An analysis of 100 consecutive cases revealed a total number of 60 reported as pathological. Twenty-three of these were operated upon and in 21 (91 per cent) the diagnosis was verified. Impressions based on "faint shadow" alone are discredited. Freshly prepared dye and carefully controlled technic are advocated as of prime importance.

WALTER H. UDE, M.D.

EYE, EAR, NOSE AND THROAT

SUPERVISORS:
VIRGIL J. SCHWARTZ,
PHYS. & SURG. BLDG., MINNEAPOLIS
E. L. ARMSTRONG,
FIDELITY BLDG., DULUTH

THE GENERAL MANAGEMENT OF INCIPIENT CATARACT OF ADULT LIFE: Luther C. Peter (Jackson Birthday Volume). In a strict sense, cataract should be looked upon as a disease of the lens, the impaired nutrition being largely the result of uveal disease, which in turn may arise from local causes such as eyestrain, choroiditis, conjunctival and lacrimal inflammations, or from more remote causes such as metastatic infections from foci and intestinal toxemias. Correction of refractive errors alone frequently relieves ciliary congestion so markedly that the nutrition of the lens is greatly improved and the cataract remains stationary or even clears slightly. However, well-developed striæ of the lens have rarely, if ever, been absorbed or dissolved. It is the diffuse lenticular haze and vitreous opacities with which best results have been obtained. The creation of a marked hyperemia in the conjunctiva and the adjacent ocular tissues, leading to improved nutrition and to the promotion of osmosis and endosmosis, has brought gratifying results in appropriate cases.

Three types of cases are chosen for treatment: first, diffuse clouding of the lens; second, striations in the peripheral layers of the lens, between the adult nuclear layer and the subscapsular zone; third, complicated cataracts with posterior capsular deposits. Results are best

in the first group, fair in incipient cases of the second group, and of some value in the third group when added to the usual treatment for uveal disease.

Attention must be directed toward the pharynx and teeth, chronic nasal conditions, lacrimal obstruction and disease, intestinal toxemia and the elimination in general; also small doses of tincture of iodine in milk, given over a period of several months, may help to arrest the cataractous process.

The most important of all the local, direct treatments has been found to be subconjunctival injections of 1 to 6,000 cyanide of mercury solution. After cocainization, 12 to 14 minims of the solution are drawn into a syringe and to this are added 3 or 4 minims of 1 per cent acoin solution, and the whole is injected beneath the conjunctiva (*not* beneath Tenon's capsule), up and out, well away from the limbus. Moderate soreness and marked edema and hyperemia of the conjunctiva and lids then set in, but these diminish rapidly on using hot applications.

After the redness disappears an eye bath of Dor's solution (one per cent each of sodium iodide and calcium chloride in distilled water) is ordered twice a day for ten or fifteen minute periods. As an alternate to this treatment, 5 per cent dionin solution may be dropped into the eye every third night before retiring. The vision must be taken and the lens observed at regular intervals.

The results have been encouraging in the types of cases already mentioned, particularly in early general, diffuse lenticular clouding, wherein rapid, often astonishing and permanent improvement has taken place. Absorption of exudates and of anterior and posterior capsular deposits have frequently been seen in complicated cataract. In all these cases the action of this solution or of any similar lymphagogue is not directly upon the cataract, of course, but upon the existing ocular pathology; improvement in the circulation of the uveal tract is followed at once by improvement in the nutrition of the avascular structures of the eye, the vitreous, lens and cornea.

VIRGIL J. SCHWARTZ, M.D.

THE CHEMOTHERAPY AND SERUM THERAPY OF PNEUMOCOCCUS AND STREPTOCOCCUS MENINGITIS: John A. Kolmer, M.D., Professor of Pathology and Bacteriology in the Graduate School of University of Pennsylvania (Archives of Oto-Laryngology, June, 1926). Yerger states that 5 per cent of those with otitic and 1 per cent of those with nasal accessory sinus infection develop meningitis. Netter reports mortality of these meningitis cases as about 100 per cent when treated by spinal puncture and the intraspinal injection of antistreptococcus or antipneumococcus serum.

Kolmer used dogs in his experimental work. Mercurochrome-220 soluble had no appreciable effect on the mortality of experimental pneumococcus and streptococcus meningitis. Also the same was true of gentian violet, neutral acriflavine and rivanol. Likewise the injection of the various sera had no beneficial effect. Lavage and drainage is the treatment of septic meningitis. He trephined and washed one or both ventricles through to the cisterna magna with Ringer's solution —escape of the fluid being provided for by insertion of a needle into the cisterna magna, using from 20 to 40 c.c. of fluid.

One treatment usually was sufficient to save the animals when the controls all died. In the treatment of humans, the usual sera or dyes could be injected after the lavage and left in the ventricles.

E. L. ARMSTRONG, M.D.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

INTERNATIONAL CLINICS. Edited by Henry W. Cattell, A.M., M.D., in collaboration with others. Volume III. Thirty-sixth series, 1926. 310 pages. Illus. Philadelphia and London: J. B. Lippincott Company, 1926.

HYGEIA OR DISEASE AND EVOLUTION. Burton Peter Thom, M.D. 107 pages. New York: E. P. Dutton & Company, 1926.

LIFE INSURANCE MEDICINE. A STUDY OF ITS PROBLEMS AND THEIR RELATION TO CLINICAL MEDICINE. Collection of papers by members of the Medical Department, New England Mutual Life Insurance Company. Vol. I. 219 pages. Illus. Boston: New England Mutual Life Insurance Company, 87 Milk Street, 1926.

OUR DOCTORS. Maurice Duplay. Translated from the French by Joseph Collins. 279 pages. Cloth, $2.00. New York: Harper & Bros., 1926.

This book will be read with great interest by both the laity and the medical profession, but for very different reasons. The lay reader will be fascinated by being admitted to the hospital wards, the insane hospital, the research laboratories, and all the interesting details of the busy doctor's life. He will feel that he sees life in the raw and is in the confidences of the physician. The medical reader will enjoy it because of the reality of the picture portrayed; he will smile at many of the conceits and foibles displayed in so realistic a manner and he may recognize many as his own. He will sympathize with the disappointments of the research worker, the stupidity of some of the medical students, and the difficultity of proving a confrere's guilt in a criminal abortion.

The hero, Professor Daruel, is young, handsome, wealthy, and successful, but hard and egotistical. He enjoys life to the fullest extent, spending his mornings at the hospital operating, and carrying on research work on cancer, his afternoons at office practice, and evenings divided between medical literary work and his various amours. He finally meets a patient's daughter who attracts him strongly but he is afraid of submerging his personality in marriage, as some of his friends have done, so he brings her to Paris and establishes a

liaison which brings him content and happiness until she develops carcinoma of the breast. At the prospect of losing her he realizes how much she means to him, so marries her and gives her every possible care but the tumor recurs and she dies, leaving him desolate without an interest in life. He neglects teaching and research work, becoming merely a practicing automaton. It remains for his old friend and master, Claude Mauceaux, to awaken his interest and revive his old enthusiasm in his work. This old man is a truly lovable character, and with his active, alert mind burning brightly in his pallid, emaciated body, he resembles a disembodied spirit. His philosophy is interesting, as for instance when Daruel says he has nothing to live for he replies that he himself has learned to live for his afternoon cup of cocoa. Then he says: "One can get much pleasure from just looking."

As Daruel gradually picks up his old interests he becomes a changed man, he is thoughtful of other people and has infinite sympathy with patients and students. But he never resumes his interest in women beyond a purely platonic friendship with Line, a young girl who is the hospital pet, and Ellen Flopesco, one of his assistants. He is honored by his country when he is sent to represent her at a Cancer Congress where he has the courage to report the failure of all his research work. The medical reader will notice lack of evidence of his ability or of results to justify his fame as an authority on cancer, but such details would not add to the story, which is, of course, written for the lay mind.

The book is light and easily read, and, written, as it is, by the son of a physician and translated by a physician who is a world renowned neurologist, as well as an author of established repute, it holds much of interest to the physician. In fact anyone who may read it will feel well repaid.

MARGARET WARWICK, M.D.

INTERNATIONAL CLINICS. Vol. 1. Thirty-sixth Series. March, 1926. Philadelphia: J. B. Lippincott Co., 1926.

This quarterly publication will be found of interest to anyone in the field of medicine. Its scope includes all the specialties. The book is edited by H. W. Cattell, M.D., of Philadelphia, with contributions of especially prepared original articles by fifteen of the most eminent physicians and surgeons in America and Great Britain. It has numerous illustrated clinical lectures which are not too lengthy to be easily read by the busy practitioner. One finds articles on sequelæ of diphtheria, massive collapse of the lung, cardiac arrhythmias; treatment of appendicitis, of metasyphilitic disorders, of local infection; the use of radium in gynecology.

There are surgical clinics by Dr. C. H. Mayo, from the Broad Street Hospital, New York, and an article on Surgical Treatment of Gastric and Duodenal Ulcers by C. F. Nassau of Philadelphia.

The close of the volume gives the progress of medicine for 1925. This briefly mentions new developments in diagnosis and treatment, with the subjects alphabetically arranged.

E. C. EMERSON, M.D.

FUNDAMENTALS OF DERMATOLOGY. Alfred Schalek, M.D., Professor of Dermatology and Syphilology, University of Nebraska College of Medicine. 239 pages. Illus. Cloth, $3.00. Philadelphia and New York: Lea & Febiger Company, 1926.

The author of this little volume states in his preface that the volume was written in compliance with repeated requests from students and general practitioners and is designed to take the place of the formerly much used compend.

One would hesitate to recommend this type of work on dermatology. It is merely the briefest outline and will probably be used mostly by students preparing for examinations. There is nothing about the book to recommend it over such short treatises as Walker's, Whitfield's, Hazen's, or several other concise texts.

H. E. MICHELSON, M.D.

THIRD ANNUAL PHYSIOTHERAPEUTIC CONVENTION. Lectures, Clinics and Discussions on Electro-Physiotherapy. Held at Logan Square Masonic Temple, Chicago, Illinois, October 20-24, 1924, Under the Auspices of H. G. Fischer & Company, Inc. 736 pages. Chicago: H. G. Fischer & Co., Inc., 1925.

This book of 736 pages is a compilation of the Minutes of the Third Annual Physiotherapeutic Convention, together with reprints of each paper presented before the body. The Convention was held under the auspices of the H. G. Fischer Co. The physicians invited to read papers had no connection with the Fischer Co.

Most of the authors take a conservative viewpoint and present their experiences with physiotherapeutic modalities simply as an adjunct in the general therapy of particular cases and in no way try to minimize or discard accepted therapeutic principles.

The book will impress the reader with the large variety of uses physiotherapeutic modalities are being put to and the increasing respect the medical profession is showing towards this field of therapy.

WM. P. SADLER, M.D.

SORRELL AND SON. Warwick Deeping. Borzoi books. $2.50. New York: Macmillan Company, 1926.

A definite charm of style and an able description of both setting and characters recommend this recent novel. A number of the characters, while being far from perfect mortals, have characteristics which stimulate emulation.

Sorrell's whole hearted dedication to his son's training and his own ultimate triumph over post-bellum difficulties furnish the warp of the story. One experiences a definite regret that an otherwise ideal parent could not give his young doctor son a nobler attitude toward the fair sex which would have enabled the son to avoid an entanglement which in real life is not so easily solved as in this novel.

The heroine's attitude toward marriage is doubtless meant to typify modern English and perhaps American tendencies. The heroine is eventually impressed with the fact that the custom of marriage is still necessary.

The fatal overdose of morphine given to Sorrell, who was undoubtedly incurable, brings up again the

question of whether the act was morally right though legally wrong. If the doctor son was right in this particular case then doctors throughout the world would be morally justified in putting thousands of individuals whom medical judgment had declared incurable out of existence. The idea is totally at variance with medical tenets. Our function is to spare life, not destroy it. If our diagnoses were infallible, it might be different. The time has not come when a consensus of several opinions is recognized by law. If the surgeon son had been a little more experienced it might have occurred to him that his father could have been kept comfortable with opiates without resorting to fatal overdosage.

CARL B. DRAKE, M.D.

PRACTICAL DIETETICS IN HEALTH AND DISEASE, Sanford Blum, M.D. 2nd Edition. 362 pages. Cloth, $4.00. Philadelphia: F. A. Davis Co., 1926.

The subject matter of this volume is arranged in two sections. The first section covers dietetics for adults and the other for infants and childen. The book is printed on a good quality of paper and has large clear type and reads easily. The diets are arranged alphabetically according to the condition to be treated, thus affording a ready access to the special diet desired. In addition there is a splendid index which enhances the value of the book.

Although one may not entirely agree with the author as to specific diets recommended for certain conditions the list will be of great assistance to anyone desiring sample diets and a general outline of the management of diet in the normal individual as well as in the various pathological conditions.

HARRY OERTING, M.D.

MICROBE HUNTERS. Paul De Kruif. $3.50. New York: Harcourt, Brace & Co., 1926.

This book is obviously written for the lay reader, but it is of unusual interest to the physician and medical student, and it will enliven their leisure hours without consuming a great deal of mental energy. It tells in a very dramatic and slightly fanciful manner of the great men who have contributed momentous discoveries to the science of medicine, men who have all been fired by the divine spark of the true research spirit.

The chronicle begins with Leeuwenhoek, who, two hundred and fifty years ago, was grinding his own lenses and examining everything within his reach, and it also includes Spallanzani, Pasteur, Koch, Roux and Belering, Metchnikoff, Theobold Smith, Bruce, Ross, V.S., Grassi, Walter Reed, and Ehrlich. The story of the struggles of each, as well as their personal characteristics, are given so vividly that these heroes of medical history become to us real living personalities and we see, as in a dear friend, their great virtues, together with their very human faults and frailties. We see them pursue their beloved research in the face of almost insurmountable difficulties. We see them disagree with each other in a very childish manner and we see the competition between Koch and Pasteur become an international issue until, goaded by their respective countries, they are driven to make premature statements of their discoveries. Different types of researchers are shown by the author's characterization of Metchnikoff and Theobold Smith. Of the former he says, "Metchnikoff was always doing experiments to defend an idea, and not to find the hidden truths of nature."

And of the latter, "Theobold Smith was all for biting into the unknown in places where there was a chance of swallowing it without mental indigestion."

But the greatest truth is spoken when he says: "And yet today we demand with a great hue and cry more laboratories, more microbe hunters, better paid searchers to free us from the diseases that scourge us. How futile! For progress, God must send us a few more marvelous searchers of the kind of Robert Koch."

At the same time that we find the subject fascinating we find our esthetic sense offended by the style which strongly suggests yellow journalism. In an attempt to attract the lay interest, to get away from medical terms, and to embellish the dry historical facts, the author has affected a style which does not at all fit his subject, and we find such expressions as "diphtheria was playing hell," "he dug ghoulishly," "infernally curious," "bawled with the belly-ache," "where God is as popular as a Soviet would be in Wall Street," abounding in practically every page. In the chapter dealing with the conquest of yellow fever he employs excusable biting sarcasm such as, "General Wood was kind to Walter Reed. He gave him money to build a camp of seven tents and two little houses,—to say nothing of a flag-pole,—but best of all he gave him money to buy men who would get handsomely paid for taking a sure one chance out of five of never having a chance to spend the money."

But even while we feel that the style lacks the dignity of the subject we must admit that it fails to spoil the book, and those who desire to be entertained and educated at the same time will find their hopes realized in "Microbe Hunters."

MARGARET WARWICK, M.D.

OCULAR THERAPEUTICS. Doctor Ernst Franke, A.O., Professor of Ophthalmology and Chief of the Second Eye Clinic of Hamburg. Translated by Clarence Loeb, A.M., M.D., Oculist to Michael Reese Hospital, Chicago. 183 pages. Cloth, $3.50. St. Louis: C. V. Mosby Company, 1925.

This little book on the medical treatment of eye diseases covers the subject in a very complete manner. There are no lengthy discussions as to the best treatment, but rather a brief mention of all possible therapeutic agents.

The first half of the book contains general and local measures that are used in eye diseases and the last half goes a little more into detail as to the treatment of each individual anatomical part of the eye.

It is a very interesting and instructive book.

K. C. WOLD, M.D.

THE RADIOACTIVITY OF NATURAL WATERS

The presence of radioactivity in mineral waters was accepted by many as an explanation of the alleged clinical effects of such waters that had attained some reputation through their use medicinally for bathing or drinking. After careful consideration of the evidence now available, the Council on Pharmacy and Chemistry of the American Medical Association concluded not to accept any radium solution for internal use the dosage of which is less than 2 micrograms per day, or any radon (radium emanation) generator that yields less than 2 microcuries of radon during each twenty-four hours. It has been estimated that to obtain the dose of 2 micrograms by drinking 1 gallon of water, which is considerably more than most people drink in a day, the radioactivity of the water would have to be about 500 millimicrocuries per liter (a millimicrocurie is the radioactivity corresponding to one-billionth gram of radium). A government expert has recently pointed out that although many waters exhibit some radioactivity, the doses necessary to produce detectable effects could not be obtained by drinking reasonable quantities of one of the naturally radioactive spring waters; of most waters it would be necessary to drink from 100 to 1,000 gallons a day. The best evidence is to the effect that, up to this time, it has not been shown that the small amounts of radioactivity found in natural waters have any effect on the medicinal value of the waters. (Jour. A. M. A. Oct. 30, 1926, p. 1480.)

Let us see how the American Medical Association meets these obligations from a financial point of view. The "Journal of the American Medical Association" had in 1900 about eight thousand subscribers Today each weekly issue excceds ninety thousand copies. For this, the physicians of the country pay an annual subscription of five dollars, and the advertising department secures each week from fifty to sixty pages of advertising. The total income derived from these sources is more than one and a quarter millions of dollars. It is this income that has enabled the Association to establish its numerous services to the physician and to the public, that has permitted the erection of the headquarters office, with a staff of almost four hundred people engaged in carrying on the work of education and the editing and printing of its publications. It has made possible the purchase of rotary and flat-bed presses, using sixty tons of paper a week in disseminating scientific, technical and popular information. It has added to the "Journal," formerly the one publication of the Association: "Hygeia," its public magazine of health; some seven journals devoted to the advancement of such medical specialties as surgery, the diseases of children, nervous and mental disease, pathology, the diseases of the skin, and similar subjects; the Spanish edition of the "Journal"; the "American Medical Directory"; the "Quarterly Cumulative Index" to medical literature; and pamphlets for the public on various health topics.

Morris Fishbein, M.D. *The Century*, Aug., 1926.

FOR SALE—Victor *X*-ray 9 inch 130 milliamperes—Fluoroscope table. Outfit includes movable Coolidge control, control box with lead glass screens, second timer, stereoscope, and two Coolidge tubes. This machine has been used very little and is in excellent shape. Priced right for quick sale. L. M. Davies, 2103 Harriet Avenue, Apt. 103, Minneapolis, Minnesota.

FOR SALE—Entire office equipment of physician and surgeon recently deceased. Includes instruments, alpine sunlight and *x*-ray machine. Excellent opening for physician in Northwestern Minnesota town of 7,000. Good surrounding territory. Address C-98, care Minnesota Medicine.

WANTED—Salaried appointments for Class A physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

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FOR RENT—Lowry Building, Saint Paul, office space nicely furnished: waiting room, examining room, telephone and light, $30.00. Address C-100, care Minnesota Medicine.

LABORATORY TECHNICIAN with experience in routine laboratory, blood chemistry, serology and basal metabolism desires position in doctor's office or hospital. Two years college. Can also do clerical work. Address C-101, care Minnesota Medicine.

WANTED—Assistantship to surgeon or position as surgical resident in hospital. M.D. from University of Minnesota, 1926. Address C-96, care Minnesota Medicine.

POSITION WANTED—Physician doing eye, ear, nose and throat work, wants part or possibly full time work in Twin Cities. Address C-102, care Minnesota Medicine.

OFFICE SPACE FOR RENT—Suitable for physician, to share reception room with dentist. Telephone Dykewater 3162, or address Masonic Building, 1508 East Lake Street, Minneapolis.

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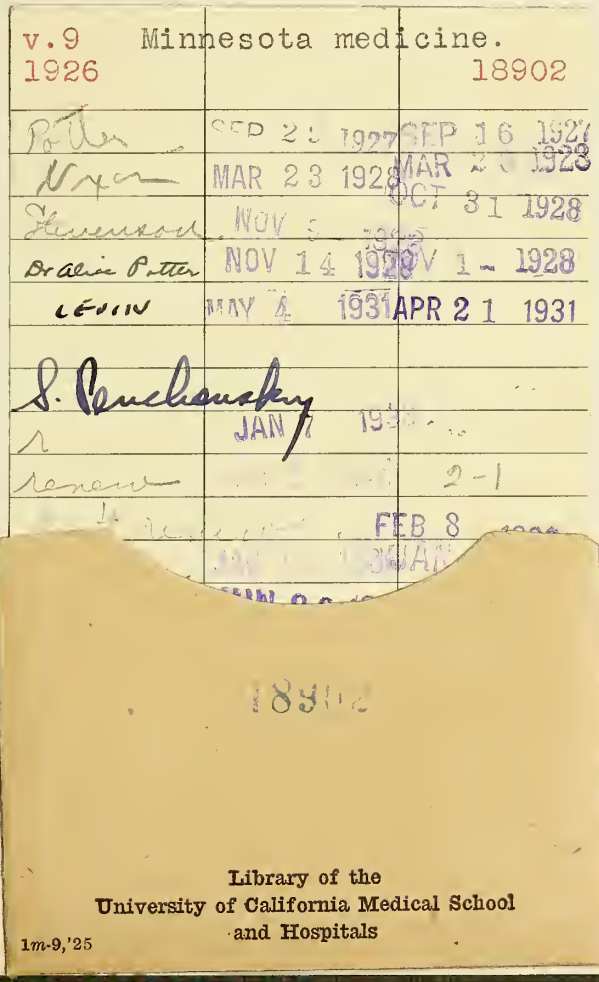
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